DOCUMENT RESUME

ED 083 713 EA 005 554

TITLE	Financing the Public Schools of Delaware. A Study.
INSTITUTION	National Educational Finance Project, Gainsville, Fla.
SPONS AGENCY	Delaware State Board of Education, Wilmington.; Office of Education (DHEW), Washington, D.C.
PUB DATE	73
NOTE	320p.
EDRS PRICE	MF-$0.65 HC-$13.16
DESCRIPTORS	Construction Costs; *Educational Finance; *Food Service; Productivity; Program Evaluation; Public Education; *School Construction; School Support; *School Taxes; State Aid; *Student Transportation
IDENTIFIERS	*Delaware; Educational Efficiency

ABSTRACT

This study includes a brief description of Delaware's public school finance program, the findings of seven special studies, an evaluation of Delaware's public school finance program, and recommendations for improvement of the school finance program. The major part of the publication considers each of the seven special studies in detail. Topics examined in these studies include State and local taxation and school revenues in Delaware; the cost of delivering education in Delaware; the status od Delaware public school personnel, 1971-1972; financing school construction in Delaware; an analysis and assessment of Delaware's pupil transportation program; school food service in Delaware; and variables associated with local school district productivity in Delaware. A 27-item bibliography is included. (Author/DN)

ED 083713

U S DEPARTMENT OF HEALTH.
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

FINANCING THE PUBLIC SCHOOLS OF DELAWARE

A Study Made by

THE NATIONAL EDUCATIONAL
FINANCE PROJECT

for

THE DELAWARE STATE BOARD OF EDUCATION

Kern Alexander, Project Director
Roe L. Johns, Director of Technical Assistance
K. Forbis Jordan, Director of Research

1973

EA 005 554

PREFACE

This study is one of a number of state studies being made by the National Educational Finance Project. It was financed jointly by the Delaware State Board of Education and the National Educational Finance Project which is financed by a grant from the Department of Health, Education, and Welfare, United States Office of Education. The National Educational Finance Project made a national study of school finance during the period 1968-72. It is now in the process of disseminating its findings and assisting individual states in studying and planning improvements in their school finance program.

The Delaware study was coordinated by Roe L. Johns assisted by Kern Alexander and K. Forbis Jordan, all of whom are from the University of Florida and members of the central staff of the National Educational Finance Project. The following persons made special studies to supplement the research of the central staff.

State and Local Taxation - Rolland A. Bowers
University of Virginia

Cost of Delivering Education - Dewey Stollar
University of Tennessee

Public School Personnel - James Jones
Temple University
and
William B. Castetter
University of Pennsylvania

Financing School Construction - Monfort Barr
and
William Wilkerson
Indiana University

Pupil Transportation - Lloyd Frohreich
University of Wisconsin

School Food Service - William Castine
Florida A & M University

School District Productivity - Scott Rose
Pinellas County, Florida
Board of Education

Educational Need and Cost Differentials - Richard Rossmiller
University of Wisconsin

Robert Isaac of the Alaska State Department of Education and Philip Kelly of the South Carolina Department of Education, presently graduate fellows at the University of Florida, also assisted the central staff in making this study.

The survey staff requested state and local school officials for large amounts of statistical information, some of which had to be compiled for this study. We wish to express our appreciation for the complete cooperation given us by the Superintendent of Public Instruction, Dr. Kenneth C. Madden and his staff, and the local chief school officers and their associates.

Roe L. Johns
Kern Alexander
K. Forbis Jordan

TABLE OF CONTENTS

Page

SUMMARY OF FINDINGS AND RECOMMENDATIONS. . . . . 1-69 *

1. The Public School Finance Program. 1-28

2. Brief Summary of Special Studies 28-49

3. An Evaluation of Delaware's Public School Finance Program. 50-55

4. Recommendations. 56-69

SPECIAL STUDIES. 70-316

1. Section 1. State and Local Taxation, and School Revenues in Delaware 70-94

2. Section 2. Cost of Delivering Education in Delaware 95-123

3. Section 3. Status of Delaware Public School Personnel, 1971-1972 124-161

4. Section 4. Financing School Construction in Delaware. 162-194

5. Section 5. An Analysis and Assessment of Delaware's Pupil Transportation Program 195-248

6. Section 6. School Food Service Programs in the State of Delaware. 249-264

7. Section 7. Variables Associated with Local School District Productivity in Delaware 265-316

* Produced as a separate report.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

This summary includes: (1) a brief description of Delaware's public school finance program, (2) the findings of seven special studies, (3) an evaluation of Delaware's public school finance program and (4) recommendations for improvement of the school finance program. The complete report of each of the special studies is appended to this summary.

THE PUBLIC SCHOOL FINANCE PROGRAM

Delaware finances its public schools from a combination of state, federal and local funds. Table 1 shows seven percent of the revenue receipts for the public schools in 1971-72 was provided by the federal government, 70 percent by the state and 23 percent from local sources.

TABLE 1

REVENUE RECEIPTS 1971-72

Source	Amount	Percent
Federal	$ 11,084,156*	7
State	115,390,243**	70
Local	37,417,025	23
TOTAL	$163,891,424	100

*Does not include $2,308,522 of federal school lunch, school breakfast, etc. funds.

**Includes payments made by the state for education as shown in Table 2 below.

Source: Department of Public Instruction.

It will be noted that state funds for the public schools include payments made directly by the state for education as well as state appropriations allocated to local boards of education. It is necessary to do this in order to get a true picture of state support for education. The Research Division of the National Education Association in its annual Estimates of School Statistics for all states also includes payments made directly by a state for the public schools. Therefore, in order to compare the school finances of Delaware with other states, it is necessary to include these payments in statistics of state funds for the public schools.

The National Education Association's Estimates of School Statistics for 1971-72 show that Delaware is exceeded by only two states, Hawaii and Alaska, in percent of revenue receipts provided by the state. This is a very favorable ranking. There has been a long time trend in the nation toward increasing the percent of revenue from state sources. The studies of the National Educational Finance Project have shown that increasing the percent of school revenue from state sources not only tends to equalize educational opportunity in a state but it also improves the equity of taxation for the taxpayer.[1]

State Funds for the Public Schools

Table 2 presents the state funds for the public schools in 1971-72. It is noted that 61.8 percent of the total is for salaries of teachers, administration, supervisors, clerks, custodians, school lunch managers, nurses and other school employees. The principal and interest on state bonds issued for school purposes comprised 12.6 percent of the total and fringe

TABLE 2

STATE FUNDS FOR THE PUBLIC SCHOOLS 1971-72

Appropriation	Amount	Percent
Division I - Salaries	$ 71,143,761	61.8
Division II - All Other Costs	7,907,398*	6.9
Division III - Equalization**	2,766,807	2.4
School Maintenance	628 175	0.5
Transportation	5,793,236	5.0
Minor Capital Improvements	835,634	0.7
Miscellaneous**	972,204	0.8
Payments of State Government for Education		
1. Insurance	614,688	0.5
2. Social Security	4,135,970	3.6
3. Pension	5,103,324	4.4
4. Blue Cross	951,747	0.8
5. Principal of debt on state bonds issued for schools	9,905,875	8.6
6. Interest on debt	4,631,424	4.0
TOTAL	$115,390,243	100.0

Source: Department of Public Instruction

*Includes $95 per pupil unit for capital outlay.
**This appropriation is called "Educational Advancement" in the statutes.
***Experimental programs, career education, etc.

benefits for school employees (social security, pension and Blue Cross), 12.6 percent; other school costs 6.9 percent; and transportation 5.0 percent. All of these funds are allocated to or expended for local school districts without taking into consideration differences in the taxpaying ability of those districts. The equalization appropriation which takes into consideration differences in local taxpaying ability amounted to only 2.4 percent of the total in 1971-72. The methods of allocation of these funds are described in the following paragraphs.

Division I Salaries. The state appropriation for salaries is determined by state salary schedules for teachers, administrators, supervisors, clerks, nurses, custodians and school lunch managers.

State funds are not allotted to a district for the teachers employed in excess of pupil units[2] allotted in accordance with the following scale:

Kindergarten.	1 unit each 50 half-day pupils.
Elementary grades	1 unit each 25 pupils, grades 1-6.
Secondary grades.	1 unit each 20 pupils, grades 7-12.
Mentally handicapped.	1 unit each 15 such pupils.
Trainable mentally handicapped. . .	1 unit each 6 such pupils.
* Partially sighted	1 unit each 20 such pupils.
Partially blind	1 unit each 8 such pupils.
Partially deaf.	1 unit each 8 such pupils.
Homebound	Cost paid by state.
Vocational.	1 unit for approximately 15 equivalent full-time students.

---

* Should be for each 10 such pupils

Omitted in error from study

Orthopedically handicapped	1 unit each 10 such pupils
Learning disability	1 unit each 8 such pupils
Socially or emotionally maladjusted	1 unit each 10 such pupils

This scale for determining the allotment of pupil units (or teacher units) in effect, weights pupils in accordance with the prevailing costs of different public school programs. According to this scale, one pupil unit is allotted for each 25 elementary pupils. Cost variations for different school programs depend largely on the pupil-teacher ratio and the instructional supplies and equipment required. The lowest cost program per pupil is the program for regular pupils in grades 1-6. Therefore, regular pupils enrolled in grades 1-6 are given a weight of 1. Since Delaware gives one pupil unit for each 20 pupils enrolled in grades 7-12 those pupils are given a weight of 25 ÷ 20 or 1.25. Mentally handicapped pupils are given a weight of 25 ÷ 15 or 1.67. The weights Delaware gives for the other types of programs can be computed in a similar manner. The National Educational Finance Project recommends that in determining educational need that pupils be weighted in accordance with necessary costs. The weighting being used in Delaware is similar to the weighting being used nationally.[3] However, each state should check the weights it is using periodically in order to validate them. New methods of teaching and new types of delivery systems may justify changing of the weights being used. A special study of cost differentials for different types of school programs in Delaware is being made by the survey staff and will be appended to this report when it is completed.

The state salary schedule for teachers in 1971-72 was as follows:

Instructional staff salaries regular.........Scheduled amount per teacher:

Level of Preparation	Teacher Experience		
	Beginner amount	Maximum amount	Years to reach maximum
No degree	$ 6,321	$ 8,579	10
B.A. or B.S.	6,773	9,030	10
M.A. or M.S.	7,676	9,933	10
Master's, plus 30 hours	8,353	10,610	10
Doctorate	8,804	11,062	10

Teachers employed on extended term..........10 percent additional for each extra month

Salaries for administrators and supervisors are allocated in accordance with a scheduled amount per approved position.

The number of clerks, nurses, custodians, and school lunch managers allocated to districts are determined by formulas and separate salary schedules are provided for each employee classification.

The school districts can pay, from local funds, salaries in excess of the state salary schedules. All districts do so to a certain extent. However, the wealthy districts can do this much more easily than the less wealthy districts. Evidence presented later in this report shows that the districts of greatest wealth usually pay teachers and other employees the highest salaries.

Division II School Costs Other Than Transportation, Debt Service and Maintenance. The state allotted $1,120 in 1971-72 per pupil unit for this purpose except for vocational pupil units. The amount allotted per vocational unit varied from 1 to 3 times $1,120 in 1971-72, depending upon the other costs for each type of vocational training but it averaged about 2.8 times $1,120 per unit.

The staff of the State Department of Public Instruction makes annual studies of the "other costs" per pupil unit and computes an index of "other costs" per pupil unit for each year. This makes it possible to compute accurately the amount needed for "other costs" per pupil unit. The State Superintendent of Public Instruction uses this information to make his annual recommendation to the State Board of Education and to the Legislature of the amount needed per unit for other costs. This is a commendable procedure.

In 1971-72, the state also appropriated $95 per pupil unit for short life capital expenditures for such items as textbooks, instructional aids and school equipment.

Division III Equalization. Only $2,766,807 was allocated by the state for equalizing the financial resources of the school districts in Delaware in 1971-72 although the most wealthy district had approximately four times the full valuation per pupil of the least wealthy district. The equalization appropriation provided $900 per pupil unit from a combination of state and local funds. The state's share is 100 percent of the amount authorized ($900 per unit) minus the local share except in no case can the state's share be more than 90 percent or less than 10 percent of the amount authorized. The local share for each district in 1971-72 was computed by the following formula. Divide the full valuation of the district per pupil enrolled on September 30 of the previous year by the state average full valuation per pupil enrolled; multiply the quotient by .50 and the product by $900 times the number of pupil units. This is a standard percentage equalizing formula used by several states. When the constant of .50 is used in this type of formula, the local share of the program equalized is 50 percent and the state share 50 percent for the district of average wealth. If the .50 constant in the above formula is changed to .75, the local share of the district of average wealth would be 75 percent and if the constant is changed to .25, it would be 25 percent.

A better percentage equalizing formula for Delaware would be based on pupil units. The local share would then be computed by dividing the full valuation per pupil unit of the district by the state average full valuation per pupil unit and multiplying the quotient by .50 (or whatever percent the legislature desired to make the local share of the district of average wealth) and multiplying by $900 per pupil unit for the number of units (or whatever level of equalization program per pupil unit the legislature desired to provide). As pointed out above, necessary school costs are more closely related to weighted pupil units than to enrollment uncorrected for necessary cost variations.

The 1972 Legislature provided a supplementary equalization fund of $800,000 for apportionment in the 1972-73 fiscal year. This was an emergency appropriation designed to provide more equalization to the districts of least wealth than the Division III formula. The Legislature divided the districts into seven categories in general according to full valuation per pupil. However, the vocational-technical districts were all classified in the highest category according to wealth. The Legislature then appropriated varying amounts per pupil unit for each category ranging from $2 per pupil unit for the category of greatest wealth to $400 for the category of least wealth. This is a rather crude formula because the differences of funds per pupil unit between the different adjacent categories were arbitrarily established. For example, $75 per unit was allocated for category 4; $175 per unit for category 5 and $375 per unit for category 6. However, the general effect of this appropriation was to tend to equalize the financial resources of the school districts of Delaware.

School Maintenance. The state allocated $628,175 for school plant maintenance in 1971-72 by a formula which currently allocates $9.00 for each year since the date of pupil occupancy of the building (up to a maximum of 30 years) multiplied by the full number of units of 25 full-time pupils housed in the building. The use of a formula of this type is desirable because it permits the districts to anticipate accurately the state funds they will have for plant maintenance and it does not give the State Department of Public Instruction unnecessary discretionary power over the allocation of state funds. The equity of the formula and the adequacy of the amount provided for maintenance should be examined from time to time. The state provided $628,175 per school plant maintenance in 1971-72. The local boards of education expended $3,234,326 for school plant maintenance in 1971-72. Therefore, the state appropriation for school plant is less than 20 percent of school plant maintenance costs.

Transportation. The state pays 100 percent of the approved cost of transportation. Pupils in grades K-6 who live one mile or more from school and pupils in grades 7-12 who live two miles or more from school are eligible for transportation to and from school. Transportation for handicapped pupils and for pupils exposed to unique hazards approved by the Department is provided at any distance. The approved costs of contracted transportation are determined by a carefully developed formula which takes into consideration such factors as depreciation; interest on investment; license; insurance; storage, cost of physical examination of drivers and vehicle inspection; an operation allowance per mile based on the size of the bus; the driver's salary; social security, workmen's compensation and unemployment compensation; an allowance of 10 percent of all of the above factors for administration, supervision and profit. The district is given the choice of either contracting for its transportation or operating publicly owned buses. The formula is slightly different for publicly owned buses because if a district desires to operate publicly owned buses, the state purchases the buses and therefore, there would be no allowance for depreciation and interest on the investment, profit and certain other items.

States paying 100 percent of the cost of transportation need to develop formulas of this type to determine the allowable cost of transportation. If this is not done, transportation costs may increase unnecessarily. Furthermore, formulas of this type prevent giving the State Department of Public Instruction unnecessary discretion over the allocation of state funds for transportation.

Minor Capital Improvement. The state provides an annual appropriation for minor capital improvements not in excess of $50,000 per project. If the project exceeds that amount, it is transferred to the major construction programs. The state pays 60 percent of the approved cost of minor capital improvements and the district 40 percent. Need must be justified by the district to the State Board of Education and supported by pertinent back-up data. Projects are approved on the basis of long-range planning and districts prepare a six-year budget which is revised annually as priorities and costs change.

Major Capital Improvement. The state pays directly for 60 percent of the approved cost of major capital outlays and the districts 40 percent. The state issues and sells bonds to finance its share of the cost of approved projects and the districts issue local bonds for the most part to provide the local share of the cost.

Since bonds may be sold in one fiscal year by the state and the proceeds frequently applied to capital outlay projects in another fiscal year, the best method of determining the cost to the state of the school construction program for any given year is to ascertain the debt service for that year on school bonds issued by the state. It is noted from Table 2 that the debt service (principal and interest) on state school construction bonds was $14,537,299 in 1971-72.

The criteria used by the Department of Public Instruction for approving a capital outlay project and determining the approved cost are described in detail in a later section of this report. The criteria for approving projects and costs are reasonably objective and appear to be equitable. They do not give the Department of Public Instruction unnecessary discretionary power and they prevent unreasonable capital outlay expenditures. If the district wishes to construct a more extensive or higher quality building, than the state approved cost, it must pay the cost in excess of the approved cost entirely from local funds.

Other State Payments for Education. In addition to payment of the debt service in state bonds issued for major school construction projects, the state also pays for the insurance on school buildings and its share of the cost of social security, pensions and Blue Cross for school employees. No formula is used for these items because the state payment is based on actual cost.

Federal Funds for the Public Schools

The federal funds allocated to the public schools in 1971-72 are shown in Table 3. There are more than 18 of these funds but four funds, ESEA Title I, Public Law 874, Vocational Education and School Lunch make up approximately 57 percent of the total. The overhead cost at both the state and federal levels of administering so many different appropriations is considerable. The National Educational Finance Project has recommended that federal categorical grants for the public schools be consolidated for the present into not more than six appropriations.[4] A desirable long-range goal is the provision by the federal government of substantial general aid. When that goal is attained, it should be possible to eliminate all or nearly all categorical appropriations.

Despite the complications of administration, federal aid makes a valuable contribution to the financing of education in Delaware. However, as shown in a later section of this study, federal funds have but little effect on the equalization of the financial resources to support education.

Local School Revenues

The revenue receipts from local sources are presented in Table 4. Ninety percent of local revenue receipts are derived from taxes. Approximately $32,785,240 was derived from real estate taxes and only about $840,000 from capitation taxes. Only eleven of the 23 districts levied capitation taxes but all levied real estate taxes for current expenses and all levied real estate taxes for debt service. However, as pointed out later in this report, the real tax rate based on full valuation varied among the districts from .61 per $100 full valuation of real estate to

TABLE 3

FEDERAL FUNDS FOR THE PUBLIC SCHOOLS 1971-72

Appropriation	Amount	Percent
ESEA Title I	$ 2,619,576	19.5
ESEA Title II	359,809	2.7
ESEA Title III	650,886	4.9
ESEA Title IV	160,120	1.2
ESEA Title V	299,471	2.2
ESEA Title VI	187,285	1.4
NDEA Title III	168,907	1.3
NDEA Title V-A	18	0.0
Public Law 815	7,223	0.0
Public Law 874	2,117,306	15.8
Headstart	393,486	2.9
Follow Through	820,072	6.1
Vocational Education	1,053,729	7.9
School Lunch	1,790,201	13.4
School Breakfast	83,948	0.6
Special Milk Program	264,579	2.0
Non-Food Assistance	39,446	0.3
Day Care	130,348	1.0
Other	2,246,268	16.8
TOTAL	$ 13,392,678	100.0

Source: Department of Public Instruction.

$1.61 per $100. It is noted from Table 2 that the state debt service for 1971-72 on bonds issued for education was $14,537,299 and Table 4 shows that the local debt service was $7,833,716. This made a total debt service of $22,371,015 in 1971-72 with state paying 65 percent of it and the local school districts 35 percent. Local boards of education actually paid $8,073,195 per debt service. Substituting this figure for the taxes levied for debt service in 1971-72, the state paid 64 percent of the cost of debt service in 1971-72 and local districts 36 percent. As pointed out above, under Delaware's school construction program, the state pays 60 percent of the approved costs of school construction projects and the state 40 percent. If the district wishes to construct a building more expensive than the state approved cost, it must pay all of the excess cost. For this reason, one would expect that the local debt service would be in excess of 40 percent rather than less. Therefore, it appears that school districts are providing part of their 40 percent of approved costs from current funds rather than borrowing all of it and also that the amount of costs in excess of approved costs which is borne entirely by the local districts is not great.

If the state desires to institute a policy of full state funding of approved capital outlays and it assumes the local debt service at the same time, the additional annual cost to the state for debt service would probably be somewhere between $7,000,000 and $8,000,000 depending upon how much of the local debt service was incurred for excess costs.

TABLE 4

REVENUE RECEIPTS FROM LOCAL SOURCES 1971-72

	Amount	Percent
I. Revenue Receipts for Current Expenses:		
a. Taxes for current operations	$ 25,791,524	69.0
b. Tuition incoming	406,265	1.1
c. Interest received	569,772	1.5
d. Rent income	203,008	.5
e. Athletic funds	361,897	1.0
f. Other	940,900	2.5
TOTAL FOR CURRENT EXPENSE	$ 28,273,366	75.6
II. Revenue Receipts for other than Current Expenses:		
a. Taxes for tuition outgoing	$ 193,926	.5
b. Taxes for debt service	7,833,716*	21.0
c. Interest construction funds	802,026	2.1
d. Minor capital outlays	313,991	.8
TOTAL FOR OTHER THAN CURRENT EXPENSE	$ 9,143,659	24.4
GRAND TOTAL	$ 37,417,025	

*The actual payment for debt service in 1971-72 was $8,073,195.

Source: Department of Public Instruction

Total Revenue Receipts Per Pupil

Table 5 shows the total revenue receipts per pupil in ADA for the school districts of Delaware. The vocational-technical and special schools are shown separately from the regular districts in this table. In 1971-72, the revenue receipts per pupil (excluding vocational-technical and special schools) ranged from a low of $836 in Caesar Rodney and $847 in Woodbridge to a high of $1,471 in Alexis I. duPont and $1,419 in Wilmington. This is a range of about 1.7 to 1. An examination of Table 5 shows that most of this difference is due to differences in local revenue. Data presented later in this report show that differences in local revenue per pupil are due primarily to differences among the districts in full valuation of real estate per pupil and also to some extent due to differences in local effort.

Expenditures

Expenditures are discussed in detail in a later section of this report and therefore, only a very brief summary is presented here. The current expenditure per pupil in Delaware in 1971-72, including payments made directly by the state for education was $1,067 as compared with the National Education Association Estimate of a national average of $929. The current expenditure per pupil in average daily attendance made by local boards of education ranged from $749 in one district to $1,258 in another district; excluding vocational-technical and special schools.

Citizens frequently ask "Where does the money come from and where does it go?" Annual tax effort is best measured by the revenue receipts

TABLE 5

REVENUE RECEIPTS PER PUPIL (ADA) BY DISTRICT 1971-72*

District	Sources of Revenue			
	State	Federal	Local	Total
NEW CASTLE COUNTY				
Alexis I. duPont	$ 765	$ 19	$ 687	$1,471
Alfred I. duPont	669	8	401	1,078
Charles W. Bush	1,580	313	504	2,397
Appoquinimink	854	97	187	1,138
Claymont	638	32	315	985
Conrad	664	20	260	944
De La Warr	749	103	212	1,064
John G. Leach	3,245	589	404	4,238
Marshallton-McKean	697	24	395	1,116
Mount Pleasant	669	9	406	1,084
New Castle-Gunning Bedford	701	15	310	1,026
Wallace Wallin School	1,681	284	269	2,234
New Castle County Voc-Tech.	1,437	83	440	1,960
Newark	669	16	345	1,030
Margaret S. Sterck	3,019	1,023	947	4,989
Stanton	692	10	331	1,033
Meadowood	2,145	425	4	2,574
Wilmington	740	229	450	1,419
TOTAL	$ 716	$ 60	$ 368	$1,144
KENT COUNTY				
Caesar Rodney	$ 666	$ 48	$ 122	$ 836
Dover Air Base		886	1	887
Kent School for Trainable	1,511	399	123	2,033
Capital	691	65	219	975
Kent County Voc-Tech	579	318	79	976
Lake Forest	712	46	144	902
Milford	732	101	131	964
Smyrna	699	56	177	932
TOTAL	$ 676	$ 150	$ 154	$ 980
SUSSEX COUNTY				
Cape Henlopen	$ 692	$ 42	$ 299	$1,033
Delmar	860		157	1,017
Indian River	706	56	151	913
Laurel	690	156	174	1,020
Seaford	734	56	155	945
Sussex County Voc-Tech	719	76	110	905
Woodbridge	697	40	110	847
TOTAL	$ 749	$ 65	$ 186	$1,000
TOTAL DISTRICTS	$ 713	$ 78	$ 302	$1,093

*Does not include payments made directly by the state for education.
Source: Department of Public Instruction.

available to boards of education. Revenue receipts exclude borrowed funds. But all borrowed funds must eventually be repaid from revenue receipts. Therefore, the best answer to the question of "Where does the money come from and where does it go?" is to present the sources of revenue receipts and to show for what purposes revenue receipts were expended during that year. Table 1 shows the sources of revenue receipts for 1971-72 and that revenue receipts totaled $163,891,424 for that year.

Table 6 shows the purposes for which revenue receipts were expended in 1971-72. Current expenditures including expenditures of boards of education and direct payments by the state consumed 83.1 percent of the total expenditures from revenue receipts. Debt service on school bonds, including payments both by the state and local boards, required 14.0 percent of expenditures from revenue receipts. Outgoing transfers required .3 of one percent and it is estimated that 2.5[5] percent of revenue receipts or $4,000,000 was expended for capital outlay.

The Report of Educational Statistics of the Board of Public Instruction does not show directly the capital outlay expenditures from revenue receipts. It would be desirable if capital outlay expenditures were presented so that it could be ascertained what expenditures were made from borrowed funds and what expenditures were made from revenue receipts.

One cannot obtain an accurate picture of the total expenditures of boards of education over a period of years by adding the amounts reported by the boards of education under the heading "Total Expenses." For example, in Table 29 of Report of Educational Statistics for 1970-71, Board of Public Instruction, it was reported that "Total Expenses" amounted to

TABLE 6
SUMMARY OF EXPENDITURES MADE FROM REVENUE RECEIPTS

	Amount	Percent
1. Current Expenditures		
a. By board of education for schools and community service.	$ 123,196,483	76.4
b. By the state for insurance, social security, pensions and Blue Cross	10,805,729	6.7
TOTAL CURRENT EXPENSE	$ 134,002,212	83.1
2. Debt Service		
a. By boards of education	$ 8,073,195	5.0
b. By the state for school bonds	14,537,299	9.0
TOTAL DEBT SERVICE	$ 22,610,494	14.0
3. Outgoing Transfers	$ 571,779	.4
4. Capital Outlay Expenditures from Revenue Receipts	4,000,000*	2.5
GRAND TOTAL	$ 161,184,485	100.0

*Estimated

Source: Adapted from data furnished from the Board of Public Instruction.

$181,137,558. But this total included $54,497,167 for capital outlay which was funded largely from borrowed funds and also $8,406,673 for debt service. This represents an inflation of expenditures because it includes the original expenditure from borrowed funds and also the expenditure for debt service to repay the funds borrowed. The total revenue receipts available for the public schools amounted to only approximately $153,000,000 in 1970-71 including payment made by the state for debt service on state school bonds, insurance and fringe benefits for school employees. A more accurate picture of expenditures from year to year can be obtained from the type of analysis presented in Table 6.

Table 6 shows that expenditures from revenue receipts totaled $161,184,485 in 1971-72. The difference between that amount and the $163,891,424 of revenue receipts available for that year probably represents an increase in the balances in the revenue receipts of boards of education.

Local District Expenditures. Table 7 shows that the current expenses per pupil in ADA (excluding vocational-technical and special schools) ranged from lows of $749 in Caesar Rodney and $782 in Woodbridge to highs of $1,319 in Wilmington and $1,258 in Alexis I. duPont. This is a range of almost 1.8 to 1. Therefore, despite the fact that the state of Delaware provides 70 percent of the revenues for the public schools of the state, the financial resources of the districts are not yet equalized. Further equalization of the financial resources of the districts can be attained by increasing the percent of revenue provided by the state or by funnelling a higher percent of state revenue through the Division III formula (or some other type of equalization formula) or by a combination of these two methods.

TABLE 7

SUMMARY OF CURRENT EXPENSES OF SCHOOL DISTRICTS 1971-72

District	Number ADA	Current Expenses	
		Total	Per Pupil Cost ADA
NEW CASTLE COUNTY			
Alexis I. duPont	2,958	$ 3,719,761	$1,258
Alfred I. duPont	10,921	10,191,139	933
Charles W. Bush	103	241,414	2,344
Appoquinimink	2,165	2,246,775	1,038
Claymont	3,631	3,037,554	837
Conrad Area	6,076	5,118,162	842
De La Warr	3,563	3,321,631	932
John G. Leach	73	293,551	4,021
Marshallton-McKean	4,275	4,256,320	996
Mount Pleasant	5,500	5,302,729	964
New Castle County Voc-Tech.	1,067	1,762,464	1,652
New Castle-Gunning Bedford	8,383	6,894,349	822
Wallace Wallin	66	125,680	1,904
Newark	14,635	12,861,348	879
Margaret Sterck	120	527,060	4,392
Stanton	5,659	5,171,789	914
Meadowood	100	308,958	3,090
Wilmington	13,557	17,883,417	1,319
TOTAL	82,852	83,264,101	1,005
KENT COUNTY			
Caesar Rodney	5,534	4,146,563	749
Cover Air Base	1,941	1,600,991	825
Kent County Trainable	89	150,485	1,691
Capital	6,457	5,596,561	867
Kent County Voc-Tech.		853,655	
Lake Forest	3,128	2,546,313	814
Milford	3,755	3,211,614	855
Smyrna	2,811	2,209,223	786
TOTAL	23,715	20,315,405	857

TABLE 7 (Continued)

District	Number ADA	Current Expenses Total	Current Expenses Per Pupil Cost ADA
SUSSEX COUNTY			
Cape Henlopen	3,529	$ 3,271,275	$ 927
Delmar	607	587,710	968
Indian River	5,731	4,755,329	830
Laurel	2,067	1,802,002	872
Seaford	3,585	3,006,051	839
Sussex County Voc-Tech.		659,882	
Woodbridge	1,975	1,544,395	782
TOTAL	17,494	15,626,644	893
TOTAL ALL DISTRICTS	124,061	119,206,150	961
State Board of Education		2,417,828	
GRAND TOTAL	124,061	$121,623,978	$ 980*

*The addition of expenditures for Insurance, Social Security, Pensions, and Other administered by the State Treasurer increased the figures for ADA to $1,067.

Source: Division of Planning, Research, and Evaluation, State Department of Public Instruction.

Delaware Assessment Practices

Assessment of property in Delaware is on a county basis and is accomplished by county assessors appointed by assessment boards. There are only three counties in the state:

New Castle

Sussex

Kent

Twenty-three "regular" districts and three vocational districts are superimposed over the three counties. The three county vocational districts are coterminous with county lines. However, there are only a few instances of a regular district being partially in two counties.

The school districts depend on the County Assessment Boards to do all assessing and tax collection. As of July 1, 1972 the following percent of assessment to full value by county pertained:

New Castle	70%	- Last complete re-evaluation 1972
Kent	60%	- Last complete re-evaluation 1966
Sussex	50%	- Last complete re-evaluation 1956

Inequities within counties also exist in that updating of assessments apparently occurs only when new information is available through property ownership changes (sales) or new construction or additions (building permits). Properties for which there is no such activity are seldom (apparently) re-evaluated. According to the Department of Public Instruction some property assessments have remained in effect for as long as sixteen years. Only one county, New Castle, has been totally reassessed in recent years, a project which took over two years.

Equitable property assessments are difficult to make under the best of conditions and Delaware with three independent assessors and no central coordinating authority seems to be in a difficult position. Actually, the problem of inequitable assessments by county has had little serious effect since the amount of money distributed under their equalization formula is relatively low. A greater problem is the inequity between districts within a county since about 22 percent of total operating funds are derived from this source.

If valuation per pupil or a comparable measure of wealth of a district is to play an important part in a revised school support program, some action must be taken to provide some or all of the following elements:

1. Updating of all district-county assessments.
2. Provision for a continuous process of evaluation.
3. A central authority with sufficient power to determine the adjusted valuation by county and district.

Although not established by law the Department of Public Instruction currently adjusts district valuations to "full value." Based upon data received from county assessors, the Department of Public Instruction uses the county assessor's determination of percent of assessment to full value and applies it to every district within that county. Since the districts within each county undoubtedly vary in ratio of assessment to full value due to differences in the rate of turnover of property, this results in inequities in the distribution of the Division III Equalization Fund. However, this is the best that the Department can do until all assessments are made current or the Department is furnished accurate information on the ratio of assessment to full value in each district.

Ability and Effort to Support Education

Ability and Effort of the State. The National Educational Finance Project made an extensive study of the relative ability and effort of the states to support education for the year 1968-69. The following four measures of ability were used: (a) personal income per school age child, (b) personal income per child in ADA, (c) net income[5] per child in ADA, and (d) per capita yield of three major state taxes. In 1968-69, Delaware ranked 12th among the states in income per child of school age, 9th in personal income per child in ADA, 13th in net income per child in ADA and 10th in estimated potential per capita yield of three major state taxes.[6] There is no reason to believe that Delaware's relative ranking has changed substantially since 1968-69. The evidence is clear that Delaware ranks among the top fourth of the states in ability to support education.

The National Educational Finance Project also made a study of the relative financial effort of the states and local school districts to support education. It was found that Delaware ranked 11th among the states in percent of net income allocated to the public schools from state and local revenues.[7]

Ability and Effort of Local School Districts. The ability and effort of school districts to support the public schools are shown in Table 8.

TABLE 8

THE ABILITY AND EFFORT OF SCHOOL DISTRICTS TO SUPPORT EDUCATION 1971-72

	Full Valuation Per Pupil Enrolled		Tax Rate Based on Full Valuation*	
District	Amount	Rank	Rate Per $100 Valuation	Rank
Alexis I. duPont	$ 52,777	1	$ 1.155	10
Cape Henlopen	34,525	2	.744	16
Mount Pleasant	27,668	3	1.274	8
Wilmington	27,657	4	1.555	2
Indian River	26,191	5	.481	23
Capital	25,780	6	.702	18
Alfred I. duPont	22,993	7	1,519	5
Delmar	22,937	8	.610	22
Claymont	22,013	9	1.281	7
Seaford	20,064	10	.629	21
Marshallton-McKean	19,898	11	1,526	3.5
Conrad Area	19,867	12	1.057	12
Smyrna	19,255	13	.819	13
New Castle-Gunning Bedford	18,863	14	1.225	9
Newark	18,144	15	1.511	6
Milford	17,786	16	.636	19
Stanton	17,095	17	1.610	1
Laurel	16,449	18	.776	15
Lake Forest	15,680	19	.796	14
Appoquinimink	15,266	20	1.137	11
Woodbridge	15,232	21	.634	20
Caesar Rodney	14,508	22	.711	17
De La Warr	13,798	23	1.526	3.5

*Includes both real estate and capitation taxes.

Source: Department of Public Instruction

The full valuation per pupil in 1971-72 ranged from $13,798 in De La Warr to $52,777 in Alexis I. duPont. This is a ratio of 3.8 to 1. The unweighted average valuation of the three most wealthy districts was $38,327 and the unweighted average valuation of the three districts of least wealth was $14,513 per pupil. This is a ratio of a little over 2.6 to 1.

Table 8 also shows the local school tax rate of real estate and capitation taxes combined, computed in terms of full valuation. The range in local tax effort in proportion to ability is very great in Delaware. The tax rate in 1971-72 ranged from a low of $.481 per $100 full valuation in Indian River to a high of $1.610 in Stanton. This is a ratio of 3.3 to 1. There seems to be little or no relationship in Delaware between ability and effort. One might expect the districts of least wealth to make a higher effort in relation to ability than the districts of greatest wealth in order to try to make their educational opportunities more nearly comparable with the districts of greatest wealth. However, the average ranking of the eleven districts of greatest wealth was 12.3 as compared with an average ranking of 11.7 of the eleven districts of least wealth.

BRIEF SUMMARY OF SPECIAL STUDIES

The survey of school financing in Delaware was supplemented by a number of special studies. Those studies are appended to this report. Following is a brief summary of the findings of each of those special studies.

State and Local Taxation and School
Revenues in Delaware - Section 1

The major conclusions of this study are as follows:

1. Nearly all known types of taxes, except the general sales tax, are utilized in Delaware by one or more levels of government.
2. The state taxes of Delaware meet the commonly accepted criteria of equity in taxation fairly well. Delaware ranks fifth among the states in the relative progressivity of its state taxes.
3. Local property taxes and local capitation taxes for schools do not satisfy very well recommended criteria for the evaluation of taxes primarily because they have but little relation to ability to pay.
4. In 1970-71, Delaware ranked 10th among the states in per capita personal income, 16th in per capita effective buying income, 17th in per household retail sales, 22nd in per household effecting buying income and 29th in per capita retail sales.
5. Delaware ranked 11th nationally in 1970 in per capita total state and local tax collections but only 29th in state and local tax collections as a percent of personal income.
6. Delaware is in the fortunate position of having additional state tax levying capacity. Delaware is one of only four states that do not levy a general sales tax. A general sales tax of 5 percent would have yielded approximately $60,000,000 in Delaware in 1969. It would yield considerably more at the present time.

7. State revenues for the public schools provide some equalization of financial resources among the districts simply because the state provides a high percent of the school revenues. However, the wealthy districts receive almost as much money per pupil from the state as the less wealthy districts. Furthermore, federal funds do not provide much equalization. The wealthy districts, by levying the same tax rates as the less wealthy districts, can obtain much more local revenue per pupil. This tends to disequalize the financial resources of the school districts of Delaware.

Cost of Delivering Education in Delaware - Section 2

The evidence presented in this study does not justify the development of a cost of delivering educational services index for each district to use in apportioning state school funds. Data are not available for each district for the development of such an index nor are data available by which variations among the districts in the cost of living could be determined. Variations do exist among the districts in per pupil expenditures for administration, instruction, attendance and health, plant operation, plant maintenance and fixed charges; but these variations are principally due to variations among the districts in the per pupil wealth and variations in local tax effort in proportion to ability.

There are some variations among the districts in the unit costs of delivering some types of educational services but these variations are not all in the same direction for different objects of expenditure. For example, the per pupil cost of land for schools is greater in the urban districts than in rural districts but the per pupil cost of transportation is greater in rural districts than in urban districts. The hourly cost of skilled labor may be greater in some urban districts than in the rural districts but when the skilled labor has to travel from an urban district to a rural district to construct a building or repair it, the cost of building construction and maintenance in a rural district may actually be greater. Therefore, it does not seem rational to attempt to develop an overall cost of delivering education index for each school district. However, there are variations in the unit costs for certain objects and functions of school expenditure and as the state approaches full state funding, these variations will need to be recognized. As a matter of fact, the state is already doing so for a number of items. Following is a summary of the state's policies with respect to recognizing variations in the unit costs of delivering educational services along with some suggestions for further extending those policies.

1. Teacher Salaries. The Delaware state salary schedule recognizes differences in the training and experience of teachers. Boards of education generally throughout the United States provide differentials in their salary schedules based on training and experience. However, the Delaware state salary schedule is so low that local boards are required to supplement the state salary schedule in order to pay teachers' salaries competitive with surrounding states. This places districts with low per pupil

valuation of property at a disadvantage. Therefore, in order to place all districts on an equal basis in competing for high quality teachers, the state salary schedule should be increased sufficiently to make it competitive with neighboring states.

The state finance plan allots teachers for whom the state salary schedule is applied in terms of pupil units which provide for varying pupil-teacher ratios. These variations in pupil-teacher ratios are based upon variations in the pupil-teacher ratios customarily required to provide the service. For example, one unit is provided for each 25 elementary pupils grades 1-6; one unit for each 20 pupils in grades 7-12, one unit for each 15 mentally handicapped pupils, one unit for 15 equivalent full time vocational pupils, one unit for each eight partially blind pupils, etc. These pupil units are customarily called teacher units or instruction units in other states because they correspond with the computed number of teachers needed to deliver the service for a given number of pupils which vary in their needs. This policy of providing different pupil-teacher ratios for pupils with varying needs or weighting pupils in accordance with necessary unit cost variations is followed in all advanced programs of state support.

There is no evidence available that shows that the cost of living for the same standard of living varies substantially among the districts of the state.

2. Administration and Supervision Salaries. The state provides a salary schedule for these salaries. Local boards of education also

supplement these salaries and this places low wealth districts at a disadvantage. This disadvantage can be removed by making the state salary schedule for administration competitive with surrounding states.

3. Salaries of Clerks, Nurses, Custodians and School Lunch Managers. State salary schedules for apportioning state funds for these personnel are also provided. No data are available that show that salary schedules for these services must vary among the districts in order to provide the services.

4. Current Expense Costs Other than Salaries and Transportation. In 1971-72, the state allotted $1,120 per pupil unit for this purpose to all units except for vocational units. Varying amounts were allotted per pupil unit for vocational education in accordance with need. The amount per pupil unit for vocational education averaged about 2.8 times the amount allotted for other units.

The State Department of Public Instruction makes annual studies of the cost of items financed from this allocation. An index of changes in the cost of current expense other than salaries and transportation is computed for each year and the percentage increase of pupil unit costs of each year over the previous year is computed. This forms the basis for making requests of the legislature for the appropriation per pupil unit for current expenses other than salaries and transportation. These studies provide a sound basis for making these requests.

5. School Construction. The state provides 60 percent of the cost of approved construction and 40 percent is provided by local school districts. This, of course, places districts with a low valuation per pupil at a disadvantage in providing for school facilities. The cost per square foot for similar types of construction may vary among the districts due to local variations in wage scales, the cost of school sites, the distance labor and materials are transported and perhaps other factors. These variations should all be included in approved costs.

6. School Plant Maintenance. The state funds 100 percent of the approved costs of school plant maintenance. This is a sound policy because the cost per pupil for school plant maintenance varies greatly among the districts due to variations in the age and condition of buildings.

7. School Transportation. The per pupil cost of transportation varies greatly among the districts due principally to variations in the density of transported pupils per square mile. The state funds 100 percent of the approved costs of transportation thereby takes care of necessary variations in the unit costs of providing for school transportation services. This is a sound policy.

8. Equalization Appropriation. The state provides two equalization appropriations which together total only approximately $3,600,000

in 1972-73. This is only approximately 3.0 of total state appropriations. It is entirely too small an appropriation to equalize the financial resources of the school districts of Delaware. The financial resources of the school districts of Delaware can be equalized only by full state funding or increasing the equalization appropriation sufficiently to equalize the financial resources of all districts to provide the educational services needed.

In conclusion, the policy of the state of Delaware for providing for differential costs of producing education is to provide for these differentials for each function of education financed. The pupil costs of different types of educational programs needed differ widely. The percent of high cost pupils varies considerably among the districts. The per pupil cost of transportation varies a great deal among the districts due largely to the density per square mile of the pupils transported. It is sound educational policy to provide for these cost differentials.

Status of Public School Personnel - Section 3

This section is devoted to an analysis of the present status of public school personnel in terms of economic conditions, staffing provisions, and supply and demand for manpower.

It can be generally concluded from this review that while provisions for public education in Delaware have not reached a state of perfection, progress has been and is continuing to be made relative to providing and retaining manpower for Delaware public schools. The following findings summarize both the progress in personnel as well as areas in need of modification.

1. While considerable progress has been made in Delaware with regard to the average salaries of instructional staff over a ten-year period (1961-62 to 1971-72), Delaware is not holding its relative salary ranking among the fifty states. In 1961-62, the average salary for instructional staff members in Delaware was $6,303 which ranked 7th among the states. In 1961-72, the average instructional salary for Delaware was $10,664, which ranked 14th among the states. Despite a 69.2 percent gain in average instructional salaries in Delaware over the period under consideration, Delaware's relative salary position is declining.
2. The relatively moderate decline of Delaware's position among the fifty states over the past decade affecting public education develops into a consistent pattern when examined in terms of a variety of variables. The state has dropped from first to third in the percent of public school revenue derived from the state government: from first to tenth in per capita personal income; risen from 48th to 45th in rank in public school revenues derived from local government; dropped from first to fourth in per capita state expenditures for all education. While it may

be said that the foregoing state of public education in Delaware is not alarming, it would be unfortunate if this regression in fiscal trends for public education continued over the decade of the seventies. Such a condition would place Delaware in a relatively weak position to compete for competent personnel needed for its schools.

3. For 1972-73 the average starting salary for teachers in Delaware without experience and a Bachelor's degree was $7,700. The average starting salary of classroom teachers for the nation as a whole in 1971-72 was $7,061. These salaries are not competitive with those in private industry. The implication of this analysis is that present starting teachers' salaries in Delaware and elsewhere are less than satisfactory from a competitive manpower standpoint.

4. As in most other areas of the United States, the supply of teachers has now caught up with, and gives every indication of exceeding by a considerable margin, the demand for educational personnel in Delaware. Some subject areas are in short supply; in others there is an unprecedented oversupply. This emerging imbalance between supply of and demand for educational personnel should enable districts to do what they have been seeking to do since the end of World War II--enable them to be highly selective in the employment of personnel.

Financing School Construction - Section 4

The major conclusions of this study are as follows:

1. The Delaware program, which has been sustained for many years, has included not only generous state support for construction, but also has accommodated the continuing need of local school districts to maintain and upgrade existing plants through the Maintenance and Minor Capital Improvement plans.
2. The program has resulted in housing more than 75 percent of all Delaware pupils in plants occupied since 1950. Yet this has been accomplished, largely because of state assumption of 60 percent of school building costs, without causing severe bonded debt burdens or extremely high debt service tax rates for most local districts.
3. The typical Delaware school district has sufficient debt leeway to permit construction of needed school buildings, but leeway is not uniform and relatively poor districts faced with a great need for buildings may be unable to raise the required local share.
4. The range of debt service tax rates was from 12 cents to 73.8 cents per $100 of taxables in 1972-73. On the basis of full valuation, the spread was from six cents to 46.9 cents per $100. While property valuation alone is not the sole determinant of the financial disparities among districts, since school building needs and local aspirations can also be influential, the six to one range

of debt service rates on actual valuations and the eight to one range on full valuations strongly indicate that the program has failed to equalize fiscal burdens among the districts.

5. Projections of future enrollments indicate that the state, as a whole, will not need to contend with enrollment gains in the next few years and thus the need for new facilities will be diminished. A few districts will continue to need new plants to accommodate enrollment gains, however. Delaware should be in an excellent position to finance any needed upgrading of existing school facilities during the remainder of this decade, and if the state properly marshals its resources, replacement or rehabilitation of all obsolete buildings can be accomplished.
6. Certain actions could be taken to enable Delaware to get more for its school building dollar. Lump-sum appropriations, removal of barriers to competition, and heavier reliance upon Department of Public Instruction school facility specialists are examples of measures which could help achieve more economy and efficiency.
7. Delaware has demonstrated that it can administer efficiently and economically a school construction program funded 60 percent from state funds and 40 percent from local funds. It would improve the equity of Delaware's school construction program if 100 percent of the approved cost of the school construction program were funded from state funds. At least the 40 percent now funded from local sources should be equalized by some type of equalization formula. As the state approaches full state funding of school construction

it would be equitable for the state to assume the local debt service incurred on school construction projects approved in prior years.

The Pupil Transportation Program - Section 5

Delaware has one of the most adequate pupil transportation programs provided state-wide in the United States. This is due primarily to 100 percent state funding of approved transportation costs and efficient state and local administration and supervision. Following are some suggestions for further improvement of the pupil transportation program:

1. If the state policy supports the concept of a complete public ownership of buses, the state could establish a planned bus-purchase program that would replace all contract equipment as it became obsolete with state-district jointly owned buses.
2. If the state policy is one of continued reliance on private contracts, the state might consider changing its statutes and policies and serve as an intermediate leasing agency. The state could purchase the buses and then lease them to private contractors to operate. The state in a sense, would act as a financier and charge to contractor the state's purchase cost over the period of the lease. A large part of the difference between public and private cost is attributable to the investment reimbursement provided contractors. For example, a $9,000 bus over a ten-year period costs $13,950. Substantial savings could result if the state purchased the buses outright and then leased them back to private contractors.

3. If the policy implies continued reliance on private sector contracts but with some local leeway, it is suggested that the state set a minimum percentage or number of buses (for example, 10-15 buses or 10 percent, whichever is greater) that will be state and/or district owned in each Transportation Supervisor's district. The implementation of the recommendation will provide school districts with a fleet of buses to use for educational and extracurricular trips and at the same time should reduce state reimbursement cost and local district costs. It is suggested that a minimum fleet size be established so that efficiency of operation, maintenance and facilities will be maintained.

4. If the policy suggests equal reliance on public and private ownership, a plan could be implemented whereby obsolete contract equipment would be replaced by public owned equipment until the proper balance is achieved. Any of these recommendations which suggest a change in the reliance on public and private equipment should be planned and implemented with some regard for the private contractor. Major and abrupt changes that affect the private contractors' livelihood or profit should be avoided. The state's policy implementation plan should have the concern of those affected in mind and then move gradually and deliberately to a selected target date for completion.

5. With respect to recommendations for specific formula changes, the following are suggested for consideration:

a. The state should apply the 10 percent administrative allowance to both south and north of the canal. Equity considerations would dictate that this is a fairer method of calculating this formula variable.

b. If the state is looking for a means of trimming the reimbursement allowances, it is suggested that the 10 percent administrative allowance be applied only to fixed charges and operations and not to the investment allowances.

c. It is suggested that some provision be made by the state for reimbursing school districts for educational related trips. A reasonable program cost could be estimated with the state supporting the minimum program based on a sliding, school district wealth scale.

d. The State Transportation Division should make a survey of the value of a bus when it is retired from service at the end of 10 years or 95,000 miles. This cost value should then be subtracted from the purchase cost of the bus before reimbursement allowances are made for depreciation and investment costs.

e. Assuming it is legal or can be made legal, the state should consider making bus transportation insurance available to private contractors. The state, acting as an intermediate agency, could accept bids in the interest of the contractor and then make the insurance available through the state or directly from the insurance company. The formula would then be changed to reflect the actual costs incurred through the insurance bids accepted by the state. A voluntary participation plan, assuming the bids received by the state were lower, would compel private contractors to select the best, lowest-cost coverage or lose money.

f. The Transportation Division of the Department of Public Instruction should be constantly studying and adjusting formula variable allowances so they are current with existing policies and geographic differentials in prices. It is suggested that District Transportation Supervisors be given the responsibility of making spot surveys of local prices and costs associated with wages, maintenance, and operation immediately prior to the approval of the reimbursement formula for the ensuing year.

School Food Services - Section 6

Delaware has a good school food service program as compared with the national average. For example 59 percent of Delaware's school enrollment participated in the school lunch program as compared with a national average of 37 percent. Delaware pays the salaries of school lunch supervisors and local school lunch managers from state funds. This policy helps to keep the price of the school lunch at a level that pupils can participate in the program. The school lunch revenues totaled $8,580,504 in 1971-72. Pupils provided $3,644,058 of that amount, the federal government, $2,177,832, the state $1,161,872 and other sources, $1,596,742.

Local tax support for the school food service program is almost nonexistent. Only five school districts reported any income from tax sources and the amount of such funds was extremely small in relation to the cash flow in the program. Many districts did, however, report various aspects of the program to be supported by the school board and not charged against school food service. For example, utilities often were in this category, as were facilities, equipment, clerical assistance, and sundry other items.

All public schools in Delaware participate in the National School Lunch Program (NSLP). This is a commendable achievement in attempting to provide adequate nutrition to all children. In accord with federal regulations, NSLP schools must offer meals to economically needy students either free or at a reduced price, contingent upon the level of family income and family size. The state of Delaware has provided all school districts with instructions for complying with the regulations and samples of necessary documents. The state, by so doing, has fulfilled its obligation with respect to policies and procedures for offering free and reduced-price lunches. Similar steps have been taken with respect to breakfasts for economically needy students.

Average daily participation in the National School Lunch Program ranged from 40 percent in one district to more than 80 percent in another excluding vocational-technical schools. The state average was 59 percent. The percentage of lunches served free or at a reduced price varied from one percent to 69 percent; the state average was a little over 23 percent.

Breakfast was available to less than one-fourth of the school children in the state during 1971-72; yet only a little over one-tenth of these children participated in the program. Although the breakfast program probably is not needed in every school, expansion appears to be in order.

Following are some recommendations for further improvement of the school food service program.

1. Seek to improve the information systems presently utilized both at the state and local school district level.
2. Seek new means of encouraging school districts to increase participation in present programs and to adopt programs not presently offered. This applies also to private schools.
3. Transfer responsibility and authority for allocation (or both allocation and distribution) of federally-donated commodities from the State Purchasing Agent to the State Supervisor of School Food Services.

4. Investigate the feasibility and consider the possibility of consolidating the purchasing function of two or more school districts within geographic regions so as to reduce costs.
5. Provide for the full approved labor costs of the school food service program from state funds or a combination of state and local tax revenues.

School District Productivity - Section 7

This was a statistical study designed to analyze the relationship of socioeconomic factors and school factors to school productivity. The measure of school productivity was the standard reading score of the fifth grade measured by a standardized achievement test. This is a limited measure of productivity but it was the best that was available. A district was classified as high productive if its reading score was above the state average and low productive if its reading score was below the state average. Following is a summary of the findings:

Socioeconomic Variables. Generally, past research efforts using multivariate techniques to analyze variation in achievement indicate that socioeconomic variables account for a larger percentage of variation in reading scores than in-school variables. The study in Delaware had similar findings.

All socioeconomic variables demonstrated significantly different mean values vetween the high productive group and the low productive group. All significant in-school variables had high correlations with at least some of the socioeconomic variables. A network of intercorrelations existed between the socioeconomic variables. The multiple correlation between reading achievement and adult educational level, median income and percent minority enrollment was .9025 which means that these three socioeconomic variables were associated with 81 percent of the variations in reading scores.

Median adult education level was the best single predictor of productivity. It alone classified accurately 91 percent of the districts. However, this variable had high correlations with income variables, median income (.64) and income above $10,000 (.64). The relationship between higher educational attainment and better personal income reflected community attitudes concerning schools. These districts tended to pay their teachers better than the average, had a higher percentage of master's level teachers and a lower percentage of teachers with less than four years of preparation. They also had higher achievement, higher percentage of post high school education, lower dropout rate and better attendance.

A quantity of recent literature is addressed to this situation. Better education leads to better income, a higher standard of living and higher aspirations for educational attainment among children. Motivational level is difficult to measure, but has great influence on educational achievement.

If motivational level affects educational attainment, then consideration of programs designed to raise motivational level is in order. Program possibilities would be better counseling (parents as well as children), community school concept, compensatory education and programs designed to enhance a child's self concept and school identity. If a child can identify with a school, the school becomes the place to be and motivational level climbs.

In-School Variables. In-school variables were interrelated with socioeconomic variables and it is difficult to credit a given amount of variation to any single variable. However, in-school variables were successful in predicting productivity.

Mean teacher salary, percentage of teachers with less than four years of training* and percentage of teachers with a Master's Degree or higher had a significant difference between the mean values in the high productive and low productive districts. Funding which would attract more skilled teachers to the lower achievement areas is worthy of consideration.

The multiple correlation between reading score and the four in-school variables; advanced preparation, average class size, teacher preparation and teacher experience was .81913. This means that 67 percent of the variation in reading scores was associated with these in-school factors.

Teacher experience was found to have a significant correlation with favorable deviations of reading scores from the reading score expected from the socioeconomic characteristics of a district.

Although attendance was not a predictor variable, mostly due to its interrelatedness with other variables, a statistically significant difference did exist between the high and low groups. Again, motivational level may well be the answer to higher achievement. The funding of programs which would encourage attendance would be worthy of consideration. If such programs are to better attendance through higher aspiration levels, the programs need to be of positive nature. Encouragement, or offering that which will attract the child to school, rather than causing the child to come to school through punitive action is desired.

---

*negative correlation with productivity.

Productivity Above or Below Expectation. As has been pointed out, productivity as measured by reading scores is highly associated with socioeconomic variables. A multiple regression equation was developed to predict what reading score to expect from given socioeconomic conditions in a district. The predicted score was then compared with the actual score. If the actual score was higher than the predicted score, the district was considered high productive. But if the actual score was lower than the predicted score, the district was considered low productive. The attempt was made to find in-school variables that were associated with favorable or unfavorable deviations from the predicted score. Since in-school variables are also correlated highly with socioeconomic variables this was a difficult task. However, it was found that one in-school variable, teacher experience, was significantly correlated with favorable deviations from the predicted score. The rank order correlation was .39 which was significant at the four percent level. This would indicate that experienced teachers are more likely to produce favorable reading scores after due consideration is given to the effect of socioeconomic factors on reading achievement.

AN EVALUATION OF DELAWARE'S PUBLIC SCHOOL FINANCE PROGRAM

The Delaware provision for financing the public schools was evaluated with respect to the following:

1. The extent to which the school finance plan equalizes educational opportunity within the state.
2. The relative progressivity of the tax structure.
3. The extent to which Delaware's provision for the financing of education meet the Criteria for Evaluating School Finance Programs[8] developed by the National Educational Finance Project.

The Equalization of Educational Opportunity

The National Educational Finance Project developed an objective method for determining the extent to which the school finance plan of a state equalizes educational opportunity.[9] A scale was developed to measure the extent of equalization beginning with a score of 1 for no equalization and ending with a score of 8.4 for complete equalization. Only one state, Hawaii, reached the maximum score of 8.4 and that state provides for full state funding of education. In 1968-69, the equalization score of Delaware was 6.2 and it ranked 9th from the top in extent of equalization. This is a relatively high score but Delaware's school finance plan does not meet the requirement of the Serrano v. Priest or the Rodriguez v. San Antonio Independent School District decisions because the quality of a child's education in Delaware is still to some extent, dependent on the wealth of the district in which he lives. The Rodriguez case was before the United States Supreme Court at the time this study of the finances of Delaware was made. Regardless of whether the Supreme Court fully upholds the Rodriguez decision, equity to the children and to the taxpayers of Delaware requires that Delaware take further steps to equalize educational opportunity by equalizing financial resources in accordance with need.

In 1971-72, the state provided 70 percent of the public school revenue, the federal government seven percent and the local school districts 23 percent. In 1971-72, only 2.4 percent of state school revenue was apportioned to local districts on an equalization basis which took into consideration differences among the districts in wealth per pupil. The supplementary state equalization appropriation of $800,000 for 1972-73 raised the equalization appropriations to only 3.0 percent of total state funds. In order for Delaware to approach the maximum equalization score, it must either approach full state funding or increase substantially the percent of state funds allocated on an equalization basis or adopt a combination of the two policies.

The Relative Progressivity of the Tax Structure

The National Educational Finance Project developed a scale for measuring the relative progressivity of a state's tax structure as compared with the progressivity of the federal personal income tax.[10] The federal personal income tax was assigned the maximum value of 50 and other taxes were evaluated in terms of progressivity as compared with the federal personal income tax. The states ranged from a low progressivity score of

14.8 for state taxes to a high of 26.7. Delaware ranked fifth from the top with a score of 25.3 for state taxes. Therefore, Delaware ranks relatively high in the progressivity of its state taxes.

Delaware was also evaluated with respect to the relative progressivity of its school revenues from state, federal and local revenues. The scores ranged from a low of 15.7 in one state to a high of 25.7 in another. Delaware ranked third from the top with a score of 24.2.[11] Delaware's high ranking on the relative progressivity of its school revenues is due to the fact that Delaware provides a higher percent of school revenue from state sources than most states. Federal taxes are the most progressive, state taxes next and the least progressive school taxes are local taxes, 98 percent of which are property taxes. The National Educational Finance Project computed the progressivity score of federal taxes at 39.90, the progressivity score for Delaware's state taxes at 25.3 and the progressivity score of Delaware's local taxes at 14.0. Therefore, the progressivity of Delaware's school revenues can be increased by increasing the percent of revenues derived from state and federal sources.

Evaluation by Finance Criteria Developed by the National Educational Finance Project

This study of Delaware was devoted entirely to an analysis of its provisions for school financing. It did not include a study of the educational program or school organization. Therefore, only the "Finance Criteria" are applied below. In the following paragraphs, the NEFP Finance Criteria are applied to Delaware.

The State School Finance Plan Should Include all Current Expenditures as Well as Capital Outlay and Debt Service to Facilitate Equitable Budgetary Planning for all Phases of Each District's Educational Program. Delaware's school finance plan only partly meets this criterion. It is true that all items of current expense and capital outlay and debt service are included in the state support plan but they are not provided for equally. For example, 100 percent of the computed allowable cost of transportation is financed by the state but only 60 percent of approved capital outlay expenditures. Furthermore, only approximately 20 percent of school plant maintenance expenditures are financed from the state appropriation for school plant maintenance. A state salary schedule is used in apportioning state funds for teacher salaries but it is too low to be competitive with neighboring states and it must be supplemented locally in order to make it competitive. Districts vary in wealth per pupil and usually the more wealthy districts provide the greatest supplements and therefore the highest teachers' salaries.

The State School Finance Plan Should Recognize Variation in Per Pupil Program Costs for Local School Districts Associated with Specialized Educational Activities Needed by Some but Not All Students, Such as Vocational Education, Education of Exceptional or Handicapped Pupils, and Compensatory Education. Delaware meets this criterion with the exception of providing state funds to meet the extra costs of compensatory education for the culturally disadvantaged. The federal government provides some funds for this purpose through Title I of the Elementary and Secondary Education Act. Several states are supplementing federal funds for this purpose with state funds. Delaware does not do so at the present time.

The State School Finance Plan Should Recognize Differences in Per Pupil Local District Costs Associated with Factors Such as Sparsity and Density of Population, e.g., Pupil Transportation, Extra Costs of Isolated Schools, Variations in Cost of Living. The Delaware state finance plan provides for the full financing by the state of the cost of transportation. Delaware does not provide in its finance plan for the extra costs of financing small isolated schools. However, Delaware is a densely settled, urban state with very few small isolated schools. Delaware does not have conditions similar to some of the sparsely settled western states which of necessity must maintain many small isolated schools. Therefore, there seems to be no need to provide for the extra costs of small isolated schools in the Delaware Apportionment Formula.

The same can be said of variations in the cost of living. The survey staff could not identify any significant, measurable differences in the cost of living for the same standard of living in Delaware. Therefore, there seems to be no need of incorporating cost of living differentials in the state apportionment formula.

The State School Finance Plan Should be Funded Through an Integrated Package Which Facilitates Equitable Budgetary Planning by the Local School District. The Delaware state school finance plan meets this criterion fairly well. The methods of calculating state appropriations are relatively simple as compared with the plans of most other states. The Legislature actually makes an appropriation for each school district in accordance with the state plans for apportioning school funds.

Therefore, each district can anticipate accurately the state funds to which it is entitled and this facilitates local school budgetary planning.

The State School Finance Plan Should Utilize Objective Measures in Allocating State School Funds to Local School Districts. Objective measures are used in Delaware in allocating state funds. Even when state funds for such functions as transportation and capital outlay are allocated on the basis of approved costs, carefully developed criteria are used in determining approved costs. Therefore, the Delaware finance plan does not give to state officials undue discretion over the allocation of state school funds.

The State School Finance Plan Should be Based on a Productive, Diversified and Equitable Tax System. The Delaware taxes are fairly well diversified with the exception that a state general sales tax is not levied. Only four states do not levy a general sales tax. The Delaware state taxes are fairly productive but the productivity could be increased by the levy of a general sales tax. However, the progressivity of Delaware's state taxes would be reduced unless food and medicine were exempted from the tax or unless families with a low income were given an annual cash rebate to compensate for sales taxes paid.

The State School Finance Plan Should Integrate Federal Funds with State Funds and Allocate to Local Districts in Conformance with the Criteria Herein Set Forth to the Extent Permitted by Federal Laws and Regulations. The Delaware finance plan seems to provide for appropriate integration of state funds with federal funds wherever possible. Unfortunately, the large number of federal categorical appropriations makes this policy difficult to implement.

RECOMMENDATIONS

Basically, Delaware has a sound program for the financing of its public schools. The state provides a higher proportion of school revenue from state sources than the national average and this policy tends to equalize educational opportunities for the children and to provide a more equitable system of taxation for the taxpayers. The methods used to allocate state funds are essentially sound. State appropriations include all functions of school expenditures but some functions are supported more adequately than others. Apportionment formulas recognize necessary variations of unit costs for different kinds of educational programs. The formulas for determining the allocation of funds to local school districts are defined objectively either in the statutes or regulations of the State Board of Education and state officials are not given undue discretionary power over the allocation of state school funds.

However, despite its good features, the Delaware provisions for school financing do not fully meet the requirements of fiscal neutrality, that a child's education shall not be dependent on the wealth of the district in which he lives. Evidence presented in this study shows clearly that variations among the districts in per pupil expenditures are due primarily to differences in per pupil wealth and secondarily, to differences in local tax effort. In 1971-72, approximately seven percent of school revenue receipts were provided by the federal government, 70 percent by the state and 23 percent by local districts. If state and local revenue only are considered, the state provides 75.5 percent of the total of state and local revenue and local districts 24.5 percent. Therefore, the state provides approximately three-fourths of the total of state and local revenue and local school districts, one-fourth. The local school tax revenue is derived almost entirely from regressive real estate and capitation taxes whereas the state revenue is derived largely from relatively progressive taxes.

The future of federal revenues is very uncertain at the present time. The National Educational Finance Project has recommended that the federal government provide 30 percent of public school revenues. Recent reports from Washington indicate that the federal government may decrease instead of increase the percent of school revenues it provides. Therefore, Delaware should not wait for the federal government to provide the funds needed to equalize educational opportunity nor should it wait for the courts to compel it to equalize educational opportunity. In 1972-73 only three percent of state funds is allocated on an equalization basis which takes into consideration differences in wealth among the districts. Assuming that Delaware wishes to finance its schools adequately and to equalize educational opportunities in the state and also to provide equity for its taxpayers, it has the following options available: (a) provide full state funding of the public schools, (b) provide sufficient state funds allocated on an equalization basis to substantially equalize the financial resources per unit of need among the districts. However, neither option (a) or (b) will provide equity for taxpayers if 23 percent of school revenue is obtained from property taxes either levied locally or on a state-wide basis. The capitation tax is probably the most absolute and the most regressive tax levied. There seems to be no economic justification for its continuance. All taxes are paid from income. Only approximately nine percent of the national income is derived from property. Approximately 91 percent of the national income is derived from compensation of employees, corporate profits, profits of unincorporated business and professional income.[11] Income from these sources can be taxed much more equitably by personal and corporate income taxes and sales taxes than by real estate taxes.

Following are some recommendations presented by the survey staff for the improvement of the provisions for school financing in Delaware. Some of these recommendations can be considered short-range and others, long-range. No estimate is made by the survey staff of the cost of implementing each of the following recommendations because it is not anticipated that all of these recommendations will be implemented immediately and because the Department of Public Instruction has staff members fully competent to make these estimates.

1. Determination of Local Share. It is recommended that the equalization formula be changed so that local share is determined as follows:

$$\text{Local Share} = \frac{\text{District full valuation per unit}}{\text{State average full valuation per unit}} \times .50 \times \begin{array}{l}\text{(the value per}\\ \text{unit set by the}\\ \text{legislature)}\end{array}$$

Educational costs are more nearly proportional to the weighted per pupil unit as defined by law than to enrollment. This recommendation could be implemented by next year.

2. The Determination of the Full Value of Property in Each District. The determination of the full value of property in each of the districts of Delaware is a very difficult problem, however, it is essential to the equitable apportionment of state equalization funds. The property is assessed on a county-wide basis and there are three counties. Theoretically, New Castle assesses property at 70 percent of true value, Kent at 60 percent and Sussex at 50 percent. Property, when it is sold, either newly constructed property or old property, is assessed at these respective percentages in each of these counties. It will remain on the books at the value set until there is a complete re-evaluation of property. New Castle re-evaluated all property in 1972 and set it at 70 percent of true value. The last time Kent re-evaluated property was in 1966. The last time Sussex completely re-evaluated property was in 1956. The method of computing true valuation in allocating the state equalization fund penalizes the county which has had the most recent re-evaluation. It also penalizes a district within a given county which has a rapid turnover of property as compared with the school district in that same county with a low turnover of property if considerable time has elapsed since the last complete re-evaluation of property in that county. In order to correct this inequity it is recommended that the state of Delaware employ a consulting firm to determine the average percentage of true value at which property is assessed in each of the school districts of Kent and Sussex counties. These percentages should then be used to compute the full value of property in Kent and Sussex counties until each of these counties has a complete re-evaluation of property. The percentage of true value at which property is assessed can be determined by comparison of appraised values with

assessed values of a properly selected stratified sample of property in each of the school districts of Kent and Sussex counties.

The foregoing should be considered a short-range recommendation. The long-range recommendation is that the state establish an agency which would provide the State Board of Education annually with accurate information concerning the percent of true value at which property is assessed in each district.

3. Capital Outlay. It is recommended that the state adopt the long-range goal of full funding of all approved capital outlay costs and all of the outstanding indebtedness of local school districts which has been incurred for approved capital outlay costs. At the present time, the state funds 60 percent of approved costs and local districts 40 percent. As an interim step to full state funding of approved capital outlay costs, the state could equalize the 40 percent required of the local districts by determining the local share as follows:

$$\frac{\text{District full valuation per unit}}{\text{State average full valuation per unit}} \times .50 \times 40 \text{ percent of the approved cost of the project.}$$

The degree of equalization can be increased by reducing the constant .50 to .40 or .30 and so on depending upon how rapidly the state desires to reach full state funding of capital outlay.

4. Teachers' Salaries. It is recommended that the state establish a realistic state salary schedule for teachers which is competitive with neighboring states and the state should pay the full cost of that schedule. Local school districts should have the authority to develop their own salary

schedules; however, the total amount paid the teachers allotted in accordance with approved pupil units should not be less than the amount provided in the state salary schedule or in excess of 10 percent of that amount. The survey staff was unable to find any significant variation among the districts in the cost of living for teachers for the same standard of living. Delaware is a small state and there seems to be no educational justification or equity in paying teachers with the same qualifications, higher salaries in one district than another. If the quality of a child's education should not be dependent on the per pupil wealth of the district, neither should the level of teachers' salaries. Under the next recommendation, sufficient equalization funds are recommended to permit any district, regardless of wealth, to supplement teachers' salaries as much as 10 percent of the state salary schedule.

5. The Equalization Appropriation-Division III. The equalization appropriations (including the Division III appropriation and the emergency equalization appropriation for 1972-73) amounted to less than $1,200 per pupil unit. This appropriation should be increased substantially at once in order to equalize the financial resources of the school districts of the state. Priority should be given to increasing this appropriation. It would be desirable to increase the equalization appropriation to approximately $4,000 per pupil unit at once and to provide that as much as one-half of this allotment could be used for supplementing the salaries of teachers and other employees. An allotment of this size would enable all districts to supplement teacher salaries as much as 10 percent of a realistic salary schedule and would leave each district with $2,000 per pupil unit to experiment

with innovative educational programs, reduce pupil-teacher ratios, provide additional educational services, or otherwise meet the educational needs of the district. Every board of education needs some unearmarked or "free money" to meet unanticipated educational needs or needs peculiar to that district. No state formula for apportioning state funds has yet been developed that is so accurate that it anticipates every educational need of every district in the state.

The only local tax effort that would be required of local districts would be their share determined by the formula recommended under item 2 above. With a per pupil equalization allotment of $4,000 per pupil unit, the local share for the district of average wealth would be $2,000 per pupil unit. This would amount to a state average of less than 10 percent of all school revenue for current expense, capital outlay and debt service from local sources. It is recommended that the Division III appropriation be set at a level that will provide substantial equalization and provide an adequate amount of unearmarked money for boards of education to experiment with innovative educational programs and to meet unanticipated needs. The local tax effort required for the Division III appropriation should not exceed state-wide, 10 percent of total school revenue.

6. Current Expense Costs Other than Salaries, Transportation and Maintenance - Division II. The state appropriation for these costs should be kept current in accordance with the index of costs developed by the State Department of Public Instruction. Priority over Division II costs should be given to increasing Division III appropriations because Division III funds are equalizing and they can be used for meeting Division II costs.

7. Transportation. The approved costs of transportation should continue to be funded in full by the state in accordance with present criteria or as those criteria may be improved from time to time.

8. Maintenance. The present formula for school plant maintenance does not provide sufficient funds for that purpose. It is recommended that the formula be amended so as to substantially fully fund from state sources the approved costs of maintenance determined in accordance with need.

9. The Vocational-Technical Schools. There are three of these schools and each serves an entire county. At the present time each of these schools is receiving the minimum amount provided from the equalization fund (Division III) which is 10 percent of $900 per unit or $90 per unit. They also receive only $2 per unit from the special equalization emergency appropriation of $800,000 for 1972-73. This is the minimum amount allocated per unit from this fund. Since a county tax of 3¢ per $100 is levied for the support of these schools, it is recommended that each of the vocational schools receive from the equalization fund an amount equal to the average amount received per unit by the school districts in the county in which the vocational school is located. This recommendation could be implemented by next year.

10. School Food Service. At the present time the state pays the salaries of school lunch supervisors and school lunch managers. It is recommended as a long-range goal that the state pay in full all approved labor costs of the school lunch program. This would enable local schools to keep the cost of the school lunch to children who pay for their lunches at a maximum of food costs only, assuming that the federal government continues to pay the cost of free and reduced price lunches.

11. Compensatory Education. Delaware does not provide state funds for compensatory education for the culturally disadvantaged at the present time. Therefore, compensatory education in Delaware is financed entirely by Title I funds received from the federal government and supplementary local funds. A number of states are now providing state appropriations for compensatory education to supplement federal funds. It is recommended that Delaware include compensatory education in the state school finance program. Additional state funds for compensatory education should be provided to local school districts only when additional services are provided for disadvantaged students in addition to those services financed from Title I funds. In order to initiate this program, it is probably advisable for the state to supply additional funds for compensatory education on an approved project basis. The request for state funds for compensatory education should be supported by data showing the number of disadvantaged children served, the supplementary educational services to be provided for these children, the cost of the basic program for these children and the cost of the supplementary services, the amount to be spent on these

children from regular state and local funds, the amount to be spent from Title I funds, and the amount requested from the supplementary state appropriation for compensatory education. After the state has developed some experience with allocating state funds for compensatory education, it may be possible to develop a pupil unit measure for compensatory education which will simplify the administration of the appropriation.

12. Pupil Units. The weighting of pupils now used to determine pupil units should be re-examined from time to time. A study of the cost differentials upon which these weightings are based is now being made by Dr. Richard Rossmiller, of the University of Wisconsin, in cooperation with the National Educational Finance Project. That study had not been completed at the time this survey report was written. When that study is completed, the present numbers of pupils allowed per pupil unit should be evaluated.

13. Additional Local Effort. If the recommendations listed above are implemented, every school system in Delaware will have the financial resources necessary to have a good or excellent school program and the tax base for supporting the public schools will be equitable. The only local tax effort required of each district is its share of the Division III Equalization Appropriation.

The implementation of recommendations 1-12 above will result in fiscal neutrality in school financing. Fiscal neutrality means that financial resources to meet educational needs are so equalized that a child's education does not depend upon the per pupil (or per pupil unit) wealth of the district in which he lives. Furthermore, the implementation of recommendations 1-12 will prevent the quality of a child's education from being dependent on the aspiration level of the people in the district in which he lives because the local share of the Division III appropriation is required local effort.

What additional local tax effort for the public schools should be permitted? The survey staff believes in complete fiscal neutrality in school financing. If local districts are permitted unlimited authority to levy local taxes to supplement the state funded program, fiscal neutrality cannot be attained because the districts with greatest wealth could provide greater supplements than the less wealthy districts and this would disequalize educational opportunities. We have recommended full state funding of education (supplemented by such federal funds as are available) with the exception of the Equalization Appropriation provided in Division III. We recommend that any additional local revenue provided at the option of the people of the respective districts be percentage equalized to the limit of the supplement permitted. We recommend that the percentage equalized supplement from state and local funds be limited to not more than 10 percent of the total state funds a district receives from Division I and II appropriations. The local share for the percentage equalized supplement should be determined as follows:

$$\text{Local share} = \frac{\begin{array}{c}\text{District full valuation}\\ \text{per pupil unit}\end{array}}{\begin{array}{c}\text{State average valuation}\\ \text{per pupil unit}\end{array}} \text{ X } .50 \text{ X } \begin{array}{l}\text{(not in excess of 10}\\ \text{percent of Division I}\\ \text{and II appropriations}\\ \text{to the district)}\end{array}$$

The state's share would be the difference between the total approved supplement and the local share provided that the provision that the state share could not be less than 10 percent or more than 90 percent should not be included in the formula.

The district, at its option, could entitle itself to a supplement ranging from 0 to 10 percent of the Division I and II appropriation by levying the additional local taxes necessary to provide its share of the supplement desired. This would provide fiscal neutrality because the quality of a child's education would not depend on the per pupil wealth of the district in which he lives. However, the quality of a child's education to some extent, would depend on the aspiration level of the people in the district in which he lives. If unlimited local supplements were percentage equalized, educational opportunity could become substantially disequalized due to differences in the level of local aspirations. Furthermore, unlimited percentage equalized supplements to the state funded basic program might cause an unwarranted increase in state appropriations. It is for these reasons that a limit of 10 percent of Division I and II appropriations is recommended for percentage equalized supplements.

It is recommended that the salaries provided by the state salary schedules for the positions allotted for Division I appropriation should not be supplemented more than 10 percent from the percentage equalized supplement and the Division III appropriation. The percentage equalized supplement should be used for experimentation with innovative educational programs, employment of personnel in addition to the personnel allotted for the Division I appropriation, instructional supplies and equipment and for such other items as the local board of education determines to be desirable for improving the quality of the educational program of the district.

The recommendations presented in items 1 to 13 above meet the requirements of Serrano v. Priest and Rodriguez v. San Antonio Independent School District.

In conclusion, school costs will continue to increase in Delaware despite the fact that school enrollment will probably be static or even decline slightly in the next few years. School costs will increase because inflation will no doubt continue in the future and because of continual demands for increasing the quality of education. Education that was adequate for yesterday is not adequate for today and education that is adequate for today will not be adequate for tomorrow. As Delaware modifies its provisions for school financing in the future, it is hoped that each change will improve the quality of education provided, will tend to equalize educational opportunity in the state and will improve the equity of the tax base for the support of the public schools.

FOOTNOTES

1. See Roe L. Johns and Kern Alexander, eds. Alternative Programs for Financing Education (Gainesville, Fla.: The National Educational Finance Project, 1971), Chapter 9.

2. The term "pupil unit" in Delaware is usually called "teacher unit" or "instruction unit" in most other states.

3. See Roe L. Johns and Kern Alexander, eds. Alternative Programs for Financing Education (Gainesville, Fla.: The National Educational Finance Project, 1971), Chapter 6.

4. Ibid., Chapter 8. In 1971-72, local boards of education derived $2,267,000 from the sale of bonds for capital outlay and the state, $10,825,218. But the actual expenditures for capital outlay were $33,259,924 in 1971-72. The balance in local funds brought forward from the previous year totaled $26,609,532. This illustrates the difficulty of answering the question of where does the money come from and where does it go if one mixes borrowed funds with revenue receipts.

5. Net income was determined by deducting from total personal income the following: personal federal income taxes paid and $750 per capita for subsistance.

6. Roe L. Johns and Kern Alexander, eds. Alternative Programs for Financing Education (Gainesville, Fla.: The National Educational Finance Project, 1971), p. 70.

7. Ibid., p. 74.

8. Ibid., pp. 232-234.

9. Ibid., pp. 237-251.

10. Ibid., pp. 251-263

11. Ibid., p. 261.

SECTION 1

STATE AND LOCAL TAXATION, AND SCHOOL REVENUES IN DELAWARE

Rolland A. Bowers
University of Virginia

This study is presented in seven sections. The revenues of state and local governments are identified in the first section. Recommended principles of taxation are reviewed in section two. In the third section a comparative analysis of the actual and recommended taxation practices are presented showing alternative sources of revenue available for support of education. The fiscal capacity of the state is examined in section four. Conclusions regarding taxation are presented in section five.

In section six the variations between school district revenue and financial ability are presented. The level of equalization of financial resources between districts is shown in section seven. Conclusions about the distribution formula are presented in the final section.

STATE AND LOCAL REVENUE

All or nearly all known types of taxes except the general sales tax are utilized in Delaware by one or more of the levels of government. Tables 1 and 2 illustrate the type and users of each tax.

TABLE 1-1

TYPES OF TAXES AND JURISDISTIONS APPLYING THEM TO INDIVIDUALS

	State	County	School Districts	Municipalities
Income				
1. Personal Income	X			
2. Wilmington Earned Income				X
3. Capilation		X	X	
Consumption				
4. Alcoholic	X			
5. Cigarette and Tobacco Products	X			
6. Pari-Mutuel	X			
7. Motor Fund	X			
8. Public Utilities	X			
9. Public Accommodations	X			
Wealth				
10. Real Property		X	X	X
11. Inheritance	X			
12. Gift	X			
13. Estate	X			
14. Realty Transfer	X			X

Source: Division of Urban Affairs, University of Delaware, "A Survey of Revenues of State and Local Government in the State of Delaware," Newark, Delaware, 1972.

TABLE 1-2

TYPES OF TAXES AND JURISDICTIONS APPLYING
THEM TO BUSINESSES

		State	County	School Districts	Munici-palities
	Income				
1.	Corporate Income	X			
	(Merchants' License Tax)				
2.	Retailers	X			
3.	Contractors	X			
4.	Manufacturers	X			
5.	Wholesalers	X			
6.	Food Processors	X			
7.	Restaurant Retailers	X			
8.	Farm Machinery Retailers	X			
9.	Grain Food Dealers	X			
	(Utilities)				
10.	Steam, gas, and Electric	X			
11.	Express	X			
	(Insurance Tax)				
12.	Wet Marine and Transportation	X			
13.	Workmen's Compensation	X			
14.	Fire Insurance	X			
15.	Others	X			
16.	(Lease Use Tax)	X			
17.	(Wilmington Gross Receipts)				X
	Consumption				
18.	Motor Fuel	X			
19.	Public Utilities	X			
20.	Public Accommodations	X			
21.	Motor Carrier Road Tax	X			

TABLE 1-2 (continued)

	State	County	School Districts	Munici-palities
22. Unemployment Compensation	X			
23. Wilmington Employee Head Count				X
Wealth				
24. Real Property		X	X	X
25. Realty Transfer	X			X
26. Franchise	X			
27. Banks and Trusts	X			
28. Telephone and Telegraph	X			
Miscellaneous Sources				
29. Licenses	X			
30. Fees	X			
31. Permits	X			
32. Fines	X			
33. Rentals	X			
34. Sales	X			
35. Interest	X			
36. Grants & Donations	X			

In addition to the thirty-six taxes listed above, the state receives non-tax revenue from the four sources shown in Table 3.

TABLE 1-3

TYPES OF NON-TAX REVENUE RECEIVED BY LEVELS OF GOVERNMENT

	State	County	School Districts	Munici-palities
Transfers	X	X	X	X
Earnings on Assets	X	X	X	X
Sales of Goods & Services	X	X	X	X
Control	X	X		X

These three tables represent the sources from which all state and local governments derive their revenue. No state taxes are earmarked for education; therefore, all state support for education comes from the general fund. The percentage of the general fund available for education is determined solely by the priority placed on it in comparison with all other state functions. If education is going to receive additional state support, it will do so at the expense of other state functions, an increase in existing taxes, or the addition of new taxes.

RECOMMENDED TAXATION CRITERIA

Due[1] identified four major criteria by which a tax structure can be evaluated. The criteria reflect widespread popular attitudes, in conformance with generally accepted objectives of contemporary society. The criteria which will be discussed separately are: economic distortion, equity, compliance and administration, and revenue elasticity.

Economic Distortions

The tax structure should be so organized that it will not cause people to behave economically in a way contrary to the objectives of society. Any tax that causes persons to change behavior to escape it will produce less revenue than could be obtained from the given tax rates if behavior were not altered. Five examples of distortions are: (1) Taxes may reduce output of some commodities relative to others or cause a loss in satisfaction on the part of those persons with high preferences for goods whose relative output is reduced. (2) Taxes may interfere with efficiency in the conduct of production and physical distribution of goods by altering decisions about the selection of methods of organization and operation utilized. (3) Tax differentials among areas may cause firms to select locations other than those that are optimal from the standpoint of efficiency. (4) Taxes may cause some persons to drop out of the labor market or seek to work fewer hours. (5) Taxes may reduce the rate of economic growth.

Equity

Most people accept the principle that a tax should be equitable. A tax is usually considered equitable if it meets the following criteria: (1) Equals are treated as equals. That means persons being in the same relevant circumstances should be taxed the same amount. (2) The distribution of the overall tax burden should be based on ability to pay as measured by income, wealth, and consumption. (3) Persons in the lowest income groups should be excluded from tax on the grounds that they have no tax paying capacity. (4) The overall distribution of the tax structure should be progressive or at least proportional to income.

Compliance and Administration

Taxes should be collectable to a high degree of effectiveness with minimal real costs to the taxpayers and reasonable costs to the government for collection.

Revenue Elasticity

Tax revenue should keep pace at given rates to governmental expenditures which tend to rise at least in proportion to national income.

The above criteria serve as the basis for evaluation of the major sources of finance for education in Delaware.

COMPARATIVE ANALYSIS OF ACTUAL AND RECOMMENDED PRACTICES

For discussion purposes, the multitude of taxes applied in Delaware have been grouped into five major types: Property, Sales, Excise, Personal Income, and Corporate taxes.

Property

The real property tax produces nearly all of the local revenue available to schools. Two other types are the capitation tax that is applied in 12 of the 23 school districts and the Wilmington earned income tax.

Economic distortion. The economic effects of the property tax are difficult to determine but certain adverse effects are known. The tax amounts to a heavy excise on housing which is only indirectly related, if at all, to the cost of education.

Because the property tax is also applied to business real estate it could and probably does affect adversely the desire of owners to rehabilitate deteriorating properties. Therefore, depressed areas tend to become more depressed than they are.

If most factors affecting the choice of a location for a business are relatively comparable, it is reasonable to surmise that the choice will be made on the basis of the property tax rate. Finally, the property tax places a relatively heavier burden, per dollar of sales, on industries that use disproportionate amounts of real property relative to sales. This excessive burden cannot be justified in financing education.

Equity. The greatest weakness inherent in the property tax is its lack of equity. Numerous studies have shown that dispersions in assessments exist. Assessments are conducted by county assessors in Delaware. The assessments, therefore, will vary to the extent that their approaches differ.

Administration and compliance. The tax is probably the easiest of any tax for a local government to administer because it is more difficult to hide property than any other tax base.

Income is usually regarded as the best measure of taxable capacity, and total net wealth as a secondary source. The property tax might be related to the latter if it were not on only one particular kind of property. Great inequity exists for those persons owning their own homes but having little current income.

Revenue elasticity. The elasticity of property tax revenue at a given rate is dependent upon (1) the relationship of increases in property values to increases in the state income, and (2) the relationship of change in assessed values to changes in sales values. The total state assessed valuations on real estate rose from $1,674,867,780 in 1968 to $1,963,709,352 or 17.2 percent while the personal income rose from $2,070,000,000 in 1968 to $2,383,000,000 in 1971 or 15.1 percent. This would indicate that the relationship was fairly high.

The relationship between assessed value and sales values was not available. However if Delaware follows the national pattern it is reasonable to assume that the lag is significant since increases are dependent upon action by assessors.

Conclusion. The objectionable features of the property tax are sufficiently serious that the case for increased use is difficult to defend for support of education. The tax, however, has many redeeming features for use for other local purposes. But when applied to education, which by constitutional provision is a state responsibility, it fails to provide equal educational opportunities or equal tax burden. This point is dramatically illustrated by observing that in one district the full value of real estate per pupil is $52,023 whereas in another district within the same county it is only $14,729.

Because the state has historically provided a relatively larger share of school revenue than has been the case in most other states and because the state has not utilized the property tax, this tax is used less in Delaware than in any other state when the revenue generated from it is measured against each $1,000 of personal income in the state. It is certainly a potential lucrative source of revenue for the municipalities.

Sales Tax

Delaware is one of only five states that does not make use of a general retail sales tax as a major source of revenue. If Alaska, which has a 5 percent local sales tax, is included, there are only four states not presently relying on the sales tax. Approximately 30 percent of total state revenue is generated from this tax nationally.

The median rate of combined local and state sales tax is 4 percent. The range is from a low of 2 percent in Indiana to a high of 7 percent in two states. Approximately half of the states allow exemptions or provide a credit against income tax liability for food, drugs, or necessary expenditures.

Equity. General sales taxes are considered more equitable than property taxes because they are charged against a much larger population. Nevertheless, they do tend to be inequitable in that persons in the lowest income groups, who are considered to have no tax paying capacity, are caused to bear a substantial burden unless the necessities of life are exempt or preferably allowed as a credit against their income tax.

A second characteristic of the tax that causes it to be regressive in nature is that persons in the lowest income groups are by necessity compelled to spend a larger percentage of their income and thus spend a larger percentage of their income for taxes than do those persons in the higher income groups.

Because the sales tax can only be made to be effectively proportional at best, it should be restricted in use relative to the progressive income tax.

Economic distortions. The three major potential distrotions to the sales tax could be reasonably easy to avoid in Delaware should it elect to enact such a tax at the state level. An economic distortion could result if separate geographical areas were allowed to apply different rates. Since Delaware has no local sales taxes and none should be authorized there is no problem.

A second distortion might prevail if surrounding states were not already utilizing the sales tax. However, the states immediate to Delaware were charging sales taxes as of 1971 at the following rates: Maryland, 4 percent; Pennsylvania, 6 percent; New Jersey, 5 percent; and Rhode Island, 5 percent.

A third distortion is sometimes created by application of the tax to some producers goods, such as industrial machinery and equipment, building materials, office supplies, fuel, etc. This distortion can probably be minimized by excluding major categories of producers goods from the tax.

The overall potential distorting effects of the sales tax appear to be minor when compared with the property tax.

Administration and compliance. The tax is relatively easy to collect and administer because the value to which the tax is to be applied is the actual sales figure. Some states have unnecessarily created inconvenience and inefficiency in administrative procedures by the establishment of minor provisions which create unnecessary headaches for the retailers, such as the rule that the retailer must pay the exact sum collected from the customer.

Serious complications are created when local sales taxes are applied to the basis of location of the purchaser. Another difficult enforcement problem arises when attempts are made to collect the tax made on sales for delivering outside of the state.

Revenue elasticity. There appears to be only a small differential between the amount of income persons receive and the amount they spend.

The elasticity of the sales tax, therefore, is relatively high.

Excise Taxes

There are six excise taxes in Delaware; three of which are clearly personal consumption taxes. The three are: alcoholic beverage tax, cigarette and tobacco products tax, and pari-mutuel tax. The other three taxes levied on individuals and businesses are: motor fuel tax, public utilities tax, and the public accommodations tax.

While these taxes can be justified as controls on the use of a commodity or as compensation for social costs for which use of the products may be responsible, they are not suitable for financing education. They are probably used because of their relative high productivity, widespread popular acceptance, and minimal damage to economic development. Excise taxes are highly regressive.

The revenue elasticity is particularly low for liquor and tobacco taxes. Increases in the rates of the motor fuel and tobacco tax are limited by the relative high rate now applied in comparison with other states. In 1971 the tax per package of cigarettes ranged from 2 to 21 cents nationally. The median rate was 12 cents while the Delaware rate was 14 cents.

The tax rate on motor fuels ranged nationally from 5 to 10 cents per gallon. The median rate was 7 cents while in Delaware it was 8 cents.

Personal Income Tax

The income tax is the only tax which is directly related to the ability-to-pay principle. It is the tax that gives the state tax system its overall progressive character. The revenue elasticity of the tax is much greater than any other tax used by the state. Economic distortion is controlled by utilizing the "piggyback" approach because the state income tax is based on the taxpayers' federal adjusted gross income which allows for necessary differences in individual circumstances.

The income tax is the principal source of state revenue. In comparison with the other states, the income tax rates are moderately high. Significant additional amounts of revenue from this source, therefore, will probably be contingent upon increases in income rather than rate changes.

Wilmington is one of the few localities in the nation and the only one in Delaware that is using a local income tax. There are numerous justifications for avoiding its use at the local level. Separate collections of the income tax are a nuisance to the taxpayer. Auditing by local governments is difficult. The tax is imposed on salaries, wages, and commissions earned by residents of the city of Wilmington regardless of their place of employment; salaries, wages, and commissions of nonresidents for work done in the city; net profits of noncorporate businesses and professions regardless of location of the business; and net profits earned by nonresidents in noncorporate businesses and professions located in the city of Wilmington. To the extent that other forms of income are exempt from this tax, it discriminates against those that are taxed. Distortion of location may be significant since liability depends upon residence. Persons have incentive to select residences in those areas of the metropolitan area that do not use the tax.

A third tax that is levied on income is the capitation tax by two of the three counties, 42 municipalities, and 11 of the 26 school districts.

The rates vary from $1 to $20 from one taxing authority to another. The tax is relatively inconsequential. Because it is erratically applied, it does not meet the test of equity. Because it is administered in connection with the property tax, it is not a particularly difficult tax to administer. The revenue elasticity of the tax is relatively nonexistent.

Corporate Taxes

The state corporate income tax is a significant producer of state revenue. The 6 percent rate and 20 percent surcharge based on the initial tax computation applied to taxable income produces a rate slightly below the national median of the 44 states using the tax.

The state corporate income tax meets all of the recommended criteria of a sound tax: It is reasonably well accepted as being equitable; it is not likely to have distorting effects upon location decisions; and, the administration is easily facilitated by reliance on Federal returns and Federal audits as the primary basis of control. The revenue elasticity is relatively high.

A variety of gross receipts are taxed by the state of Delaware. In general they are not desirable because of their cumulative nature to distort business methods, and leading firms to produce goods and services themselves instead of acquiring them from other firms. The tax is only indirectly related to ability to pay.

The city of Wilmington also collects a gross receipts tax on the sales of the Delmarva Power and Light Company. Although this tax raised $86,000 in 1971 the net amount was less than that because the company is allowed to credit its property tax against the gross receipts liability. Wilmington also collects an employee head tax.

Two taxes related to wealth are collected from corporations. They are subject to the same real property and realty transfer taxes that individuals are.

The franchise tax is utilized by only two states. Delaware makes extensive use of it. It is the second most important source of tax revenue in the state. The amount of tax is determined by the size of the company rather than by its income. The franchise tax suffers the same limitations that other nonincome related taxes do.

FISCAL CAPACITY OF THE STATE

There are at least seven measures of fiscal capacity that reveal something about the nature of a state's ability to support the cost of government. The measures utilized in this study are: 1971 per capita personal income, per household effective buying income, per capita effective buying income, per capita retail sales, per household retail sales, per capita real value of property and per pupil real value of property.

There is still much disagreement as to what represents ability to pay taxes. Some advocate that possession of wealth is the best measure. If ability to pay is represented by possession of real property and wealth, the per capita real value of property and the per pupil real value of property is the best measure of tax paying ability.

Others believe that volume of spending is a better gauge of ability to pay. In which case the per capita retail sales or per household retail sales would be a good index.

Finally, a third group would suggest that taxes can only be paid with income and, therefore, per capita income, per household effective buying income, or per capita effective buying income are the more accurate measures. It is our belief that a composite of all seven indicators represents a more useful guide than any one alone. However data are not available in the real value of property in all states.

It is shown in Table 4 that Delaware ranks relatively high on four of the five indicators of fiscal capacity for which data are available. It ranks particularly high in the income categories. The effect of the high income level is noted by the fact that Delaware was ranked eleventh nationally in per capita total tax collections in 1970, but ranked only 29 in state and local tax collections as a percent of personal income.[2] Delaware ranked sixth among the states in 1970-71 in state and local revenue for public schools as a percent of personal income.[3] This is a commendably high ranking.

Delaware is in the fortunate position of having additional state revenue capacity. A general sales tax is levied in all but four states. Delaware does not levy a general sales tax. Studies made by the National Educational Finance Project show that a 5 percent general sales tax would have yielded $60,000,000 in Delaware in 1969.[4] It would, of course, yield considerably more at the present time.

Delaware ranks fifth among the states in the relative progressivity of its state taxes.[5] The levy of a state general sales tax would reduce somewhat the progressivity of Delaware's state tax structure. However, if food and medicine were exempted from the sales tax, or if persons of low income were given an annual cash rebate or credit on state income taxes,

TABLE 1-4

DELAWARE COMPARED NATIONALLY ON FIVE FISCAL CAPACITY MEASURES

	Per Capita Personal Income 1970*	Per Household EBI 1971*	Per Capita EBI 1971*	Per Capita Retail Sales 1971*	Per Household Retail Sales 1971*
National Ranking					
Delaware	10	22	16	29	17
Amount					
Highest State	$4,856	$10,803	$4,325	$2,771	$7,656
Delaware	4,324	8,114	3,564	1,880	6,221
U.S. Average	3,914	8,463	3,558	1,892	6,020
Lowest State	2,575	5,452	2,376	1,461	4,628

*U.S. Department of Commerce - Survey of Current Business

**Sales Management, "Survey of Buying Power," July 10, 1972 the general sales tax would not be unduly regressive.

VARIATIONS BETWEEN SCHOOL DISTRICT REVENUE AND ABILITY

District Profiles

Figure 1 is a graphic profile of the State of Delaware. The 23 school districts are arranged, from top to bottom, in descending order of financial ability per child as measured by full value of real estate value per pupil. Along the horizontal axis, revenue per child is portrayed in terms of the state revenue for the basic state program, the special purpose categorical revenue, the local revenue not required for the basic state program, and the federal revenue. Local revenue is not required as a condition for participation in the distribution of state funds. The profile provides a visual indication of the relationship between financial ability and revenue per pupil.

Analysis of the Profile

For purposes of this presentation, Division I and II funds were classified as basic state aid; all other state aid was classified as special purpose revenue. Approximately 7 percent of the total school districts' revenue came from federal sources, 73 percent from the state, and the remaining 20 percent was raised locally.

It is perhaps debatable as to whether or not all funds except Division III should not have been classified as basic state aid. The effect, however, is inconsequential because whether the basic state aid

FIGURE 1-1

REVENUE PER PUPIL IN AVERAGE DAILY MEMBERSHIP

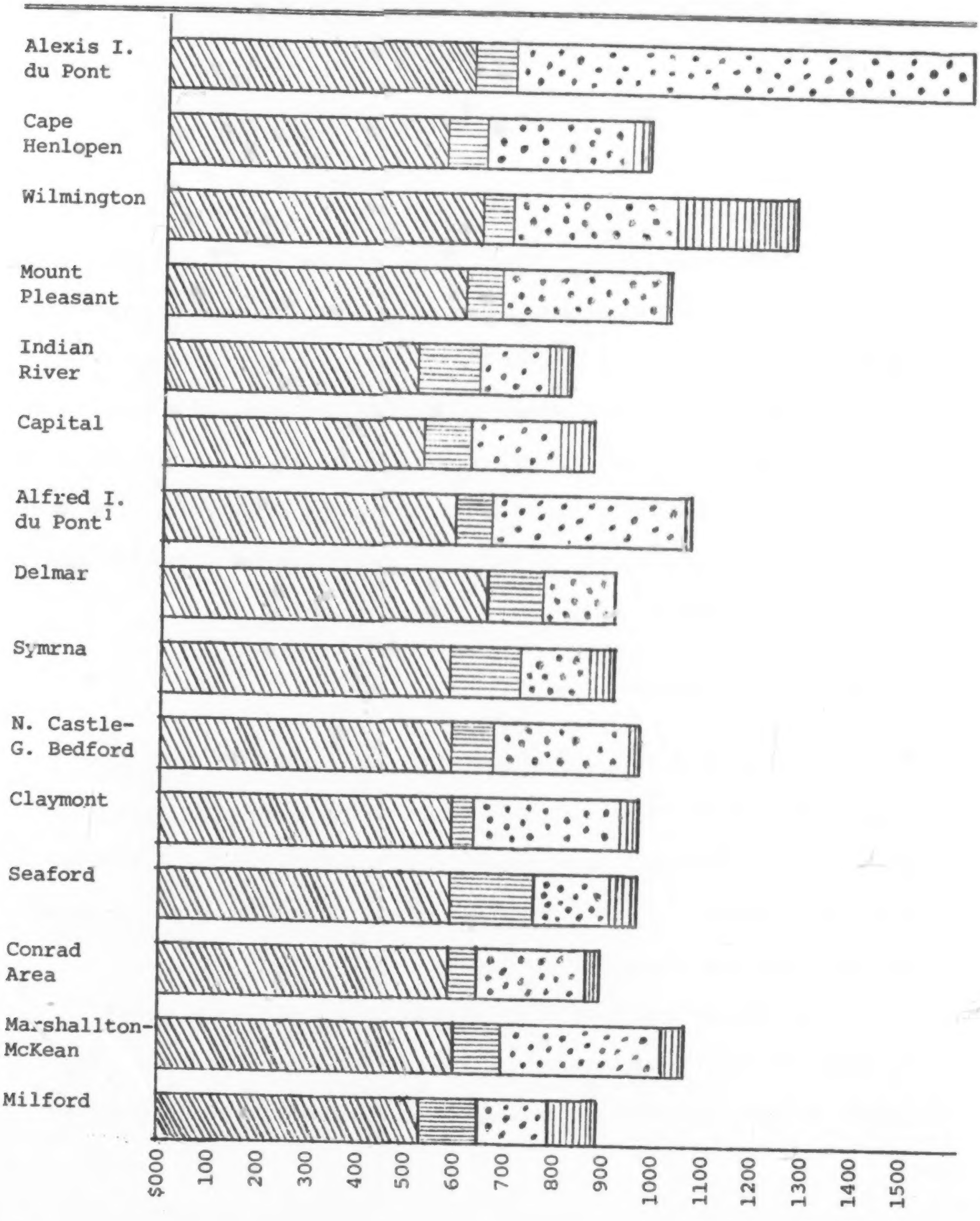
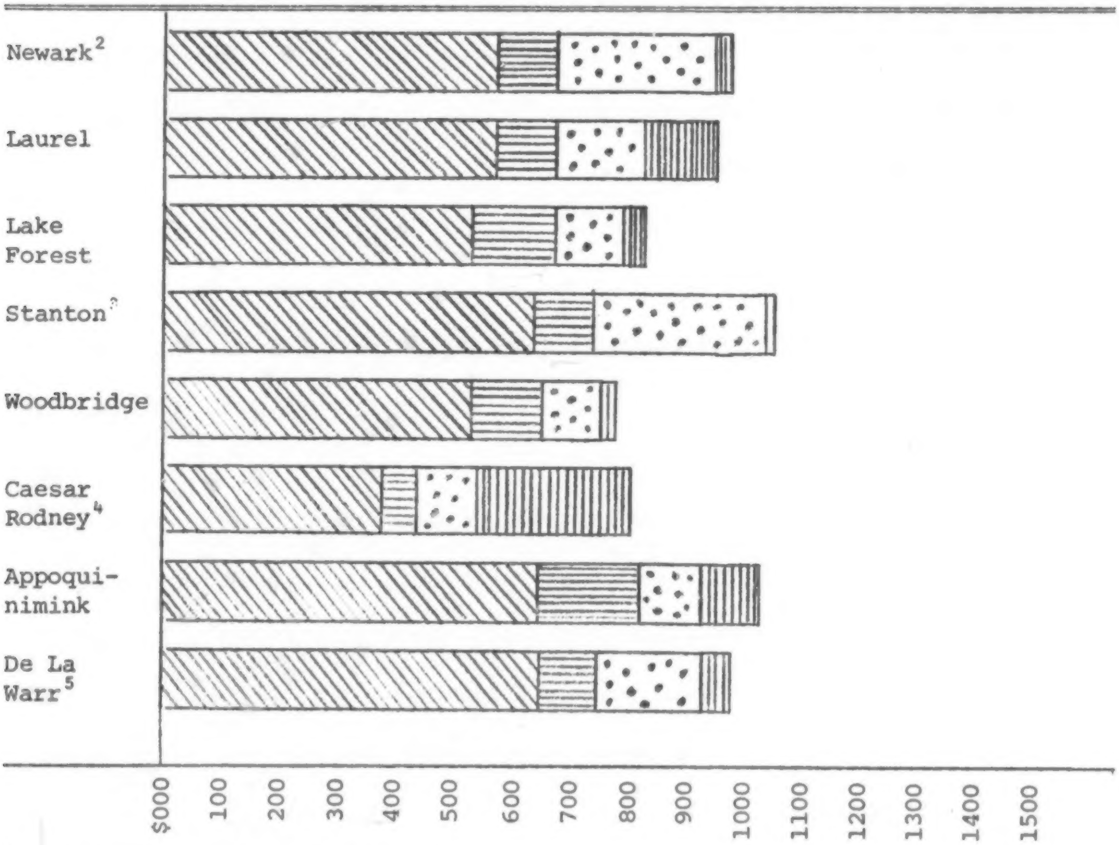


FIGURE 1-1 (continued)



[1] Includes Charles W. Bush School
[2] Includes Margaret Sterck School
[3] Includes Meadowood School
[4] Includes Dover AFB and Kent County School for Trainables
[5] Includes John G. Leach School

▧ Basic State Program
▤ State Special Purpose
░ Local Revenue
▥ Federal Revenue

as classified here or the combined basic and special state funds are viewed separately or together the amount of state aid available to the individual districts on a per pupil basis is nearly equal and therefore, had some equalizing effect.

The little difference that exists can be accounted for by the weighted pupil adjustments incorporated into the formula for the determination of need. Adjustments are made on the basis of the number of pupils in programs for exceptional children and vocational technical education.

Considerable differences in total revenue available per pupil exist, however, as a result of widely varying amounts of nonrequired local revenue provided the separate districts. A ratio of 7.54 to 1 existed between the amount of local revenue available in the district with the greatest amount of local revenue and the district with the least amount available per pupil.

To fully comprehend the effect of the distribution formula it is helpful to know that the ratio between the ability of the most wealthy district and the least wealthy district was 3.95 to 1. The ratio of total revenue per pupil received by the district with the greatest amount when compared with the district which received the least amount was 1.83 to 1.

It might be surmised that the difference was accounted for by additional effort on the part of taxpayers in some districts having aspirations for the education of their children. A Spearman Rho test of the significance of the rank ordered differences between available local revenue per pupil and full value of real estate per pupil in the districts produced a correlation coefficient of -.56 which was statistically significant at the .01 level. Local revenue, consequently, had a disequalizing effect on the districts. Furthermore, federal revenues do not seem either to equalize or disequalize.

LEVELS OF EQUALIZATION

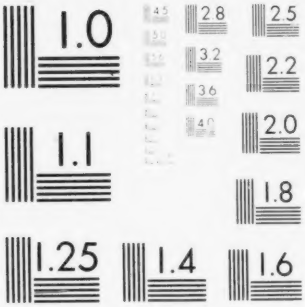
Although it was indicated in Section VII that the state funds distributed were equalizing in effect, no mention of the level or degree of equalization was implied. To determine that all state and local funds were categorized according to the NEFP typology, a continuum ranging from Level 0, which provides for no equalization, to the highest level of equalization which is Level 4. A scoring system was developed which assigned a value of 1 to the zero level of equalization and a value of 8.4 to Level 4 of equalization.

This study was concerned with revenue for current operations only but it is important to note here that the state provides 60 percent of all approved construction costs. To the extent that approval of projects recognize variations in need, the portion of debt service provided by the state is also classified as Level 2.

In 1968-69 the NEFP staff found that Delaware had an equalization score of 6.2 and ranked ninth among the states in level of equalization.[6] There is no reason to believe that the ranking has changed significantly during the last four years. The relatively high ranking was caused by the proportionally high percentage of school revenue that is provided from states sources.

2 OF 4

ED 083 713



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

CONCLUSIONS

The Delaware state plan for education has many desirable characteristics. First, a relatively high percentage of nonfederal revenue is provided by the State. The effect of this characteristic is that a higher degree of equalization has been achieved than would have been the case had there been greater reliance on local funds which are derived from nonequal property tax bases.

Secondly, the amount of state aid received by the localities is based upon the number of pupil units of need which take into consideration necessary variation in the per pupil costs of different types of educational programs. The effect of this characteristic is to provide proportionally more funds to those districts having the greatest amounts of need.

There is, however, one weakness in the plan. Local districts supplement state funds and the state and formula does not adequately take into consideration differences among the districts in the full valuation of property per pupil. Therefore the quality of a child's education in Delaware still depends to some extent on the wealth of the school districts in which he lives.

FOOTNOTES

1. This section abstracts and summarizes the research reported in John F. Due, "Alternative Tax Sources for Education," *Economic Factors Affecting the Financing of Education*, ed. Roe L. Johns, Irving J. Goffman, Kern Alexander, and Dewey H. Stoller (Gainesville, Fla.: National Educational Finance Project, 1970), Chapter 10.

2. Research Division - National Education Association, *Rankings of the States 1972* (Washington, D.C.: The Association, 1972), pp. 42-43.

3. *Ibid.*, p. 50.

4. Roe L. Johns, Irving Goffman, Kern Alexander, and Dewey Stoller, *Economic Factors Affecting the Financing of Education*, Vol. 2 (Gainesville, Fla.: The National Educational Finance Project, 1970), p. 307.

5. Roe L. Johns and Kern Alexander, *Alternative Programs for the Financing of Education* (Gainesville, Fla.: The National Educational Finance Project, 1972), p. 260.

6. Roe L. Johns and Kern Alexander, *Alternative Programs for the Financing of Education*, Vol. 2 (Gainesville, Fla.: The National Educational Finance Project, 1972), p. 250.

BIBLIOGRAPHY

Advisory Commission on Intergovernmental Relations. *State and Local Finances: Significant Features 1967 to 1970*. Washington: Government Printing Office, 1969.

Bureau of the Census. *State Tax Collection in 1971*. Washington: Government Printing Office, 1971.

Cluck, James W. "Minor Capital Improvement Program for Delaware Public Schools for Fiscal Year 1973." Dover, Del.: Department of Public Instruction, 1971. (Mimeographed.)

Johns, Roe L. and others (ed.). *Economic Factors Affecting the Financing of Education*, Vol. 2. Gainesville, Fla.: National Education Finance Project, 1970.

Johns, Roe L. and others (ed.). *Planning to Finance Education*, Vol. 3. Gainesville, Fla.: National Education Finance Project, 1971.

Johns, Roe L. and others (ed.). *Status and Impact of Educational Finance Programs*, Vol. 4. Gainesville, Fla.: National Education Finance Project, 1971.

Jones, Anne T. and James L. Spartz. "Assessments and Tax Rates: Delaware Public Schools 1972-73." Dover, Del.: Planning, Research, and Evaluation Division of Department of Public Instruction, 1972. (Mimeographed.)

President's Commission on School Finance. *Schools, People, and Money: The Need for Educational Reform*. Washington: Government Printing Office, 1972.

Rutledge, Edward C. "A Survey of Revenues of State and Local Government in the State of Delaware." Newark, Del.: Division of Urban Affairs, University of Delaware, 1972. (Mimeographed.)

Sales Management. "Survey of Buying Power." *Sales Management*, July 10, 1972.

State Board of Education and Department of Public Instruction. *Report of Educational Statistics 1970-71*. Dover, Del.: The Department, December, 1971.

U.S. Department of Commerce. *Survey of Current Business*, August, 1972.

SECTION 2

COST OF DELIVERING EDUCATION IN DELAWARE

Dewey Stollar
University of Tennessee

The problems of financing public elementary and secondary education are numerous. First, in almost every part of the country, education revenues are inadequate and are becoming even more so at an alarming rate. Second, there are severe inequalities in levels of expenditure per pupil and in educational services among school districts within states as well as between states. And third, related to both of the previous problems, the tax burden for the support of public education is unequally shared.

The problem--inadequacy of school revenues--has until recently, received most of the attention. There have been numerous reports of cutbacks in educational services, reduction of staff, and even the temporary closing of schools because of the loss of anticipated revenues.

Recognizing the basic inequalities in the capacity of different school districts to raise revenues, and the difficulty that some school districts have in raising sufficient funds for even a "minimum" program, states have historically provided funds to school districts to supplement their locally raised revenues. Most states have distributed some funds as a flat grant to school districts, which means that an equal dollar amount per pupil is distributed to every school district in the state regardless of its wealth or poverty; through a formula which attempts to equalize on the basis of the fiscal ability or capacity of a district to raise local revenues; or some combination of the above.

The current state education formulas are inadequate from a number of standpoints:

1. The fact that the formula maintains the heavy reliance on the local property tax result, as already noted, in inequalities due to the differences in the underlying tax base, in assessment practices, and in tax rates.
2. The fact that many of these formulas include a flat grant to all districts regardless of fiscal capacity, helps to maintain the gap between wealthy and poorer districts.
3. Most state aid formulas do not adequately take into account differences in unit costs among districts for the same service which differences are caused by factors beyond the control of the district.
4. Inadequate measures of fiscal need are incorporated in the formulas.
5. State aid equalizing formulas are usually based on property wealth which frequently is inadequately measured because of unequal assessing practices.
6. Many existing distribution formulas do not take into account factors relating to the higher cost of educating certain types of children such as the culturally disadvantaged.

This study will focus upon number three above.

Other sections of this report show that most of the differences among Delaware districts in per pupil expenditures are due to differences among the districts in property valuations per pupil and differences in local tax effort. This section does not deal with these differences because they are dealt with elsewhere in this study.

Different educational programs within the same district cost different amounts per pupil. For example, senior high schools generally cost more per pupil than elementary schools; programs for exceptional children cost more per pupil than for non-exceptional pupils and, programs for vocational pupils generally cost more per pupil than non-vocational high school programs. These cost differentials are primarily due to necessary variations in pupil-teacher ratios. These cost variations are recognized to some extent in the Delaware school finance program and also in the school finance programs of most other states. School districts vary considerably in the percent of high cost pupils therefore, it is only equitable that they be recognized in the state school finance program. However, differentials of this type are treated in another section of this study and will not be dealt with here. This section of the report is concerned primarily with non-school program factors beyond the control of boards of education which affect the unit costs of providing educational services, programs and facilities. Such factors might include variations in the following: cost of living, wage scales, cost of school sites, costs of transportation due to sparsity, rents, life style expectations of school employees and similar factors.

This study will involve all school districts in the state. Generally, this would not be true but Delaware is a small state with a relatively small number of school districts. In some cases comparisons will be made between particular school districts because data were only available for those particular districts. Due to the absence of certain data on a school district basis comparisons will be made between counties.

At present we do not have adequate measures reflecting living cost differentials for school employees living in different communities. The present Consumer Price Index is inadequate because of the introduction of new products and services have reshaped buying habits. People shop at different kinds of retail establishments. For example, the recent shift to discount stores has affected the prices people pay. Population shifts--both as to age and location--has affected the nature of consumer needs and satisfactions. The attempt is made in this study to identify factors that cause variations among the districts in the costs of producing education.

VARIATIONS IN ECONOMIC CONDITIONS IN DELAWARE

Income Range

In 1959 only 19.6% of all families in Delaware had incomes above $10,000. By 1969 this proportion had jumped to 51.4%. The percentage of families with incomes less than $5,000 decreased from the 1959 level of 35.6% to 15.5% in 1969. The following table shows a comparison of the income ranges for both periods.

TABLE 2-1

INCOME (1960-1970) OF FAMILIES IN DELAWARE
PERCENT DISTRIBUTION

	1959	Percent	1969	Percent
Total	111,942	100.0	136,915	100.0
Less than $1,000	4,148	3.7	2,677	2.0
$ 1,000 - $ 1,999	6,224	5.6	3,404	2.5
2,000 - 2,999	7,486	6.7	4,151	3.0
3,000 - 3,999	9,638	8.6	5,207	3.8
4,000 - 4,999	12,333	11.0	5,746	4.2
5,000 - 5,999	13,718	12.3	7,432	5.4
6,000 - 6,999	12,287	11.0	7,830	5.7
7,000 - 7,999	10,273	9.2	9,315	6.8
8,000 - 8,999	7,784	7.0	10,654	7.8
9,000 - 9,999	6,056	5.4	9,995	7.3
10,000 - 14,999	14,383	12.8	39,889	29.1
15,000 - 24,999	5,470	4.9	24,430	17.1
25,000 - Over	2,142	1.9	7,185	3.2
Median Income	$ 6,197		$ 10,211	

Source: Delaware State Planning Office, Delaware Economic Indicator Quarterly, April, 1972, p. 5.

Mean Family Income

A study of the county averages indicates that income levels have, in the past, been quite closely related to geographical location in the state. An analysis by Census County Division shows that some very substantial income disparities exist among the sub-county areas--as seen by the comparison of mean incomes in Figure 1. Highest incomes are found in heavily industrialized northern New Castle County. In Kent and Sussex Counties, the Dover, Seaford and Lewes CCD's have noticeably higher values than the other downstate areas. Both Milton and Central Kent had median family incomes less than $8,000. There is a striking contrast between the state's poorest CCD (Milton - $7,743) and its richest (Piedmont - $27,440).

Poverty Level

Family income averages and ranges alone do not always provide a clear representation of the income deficits of poorer families unless consideration is given to other factors such as family size. For example, even though the 1969 median family income of $8,503 in Kent was higher than the $8,258 average in Sussex, per capita income was higher in Sussex at $2,649 compared to $2,582 in Kent. This results from a larger average family size in Kent. Per capita income in New Castle was $3,557. See Figure 2.

A poverty level definition originated by the Social Security Administration in 1964 was included in the 1970 Census results. In addition to family size, the poverty income range was adjusted by sex of the family head, number of children under 18 years old, and farm and non-farm residence. Examples of the poverty level cut-off would be an income of $3,745 for a non-farm four person family with a male head of $3,197 for a farm family with similar characteristics.

FIGURE 2-1

MEAN FAMILY INCOME, 1969 (DOLLARS)

Source: Delaware State Planning Office.

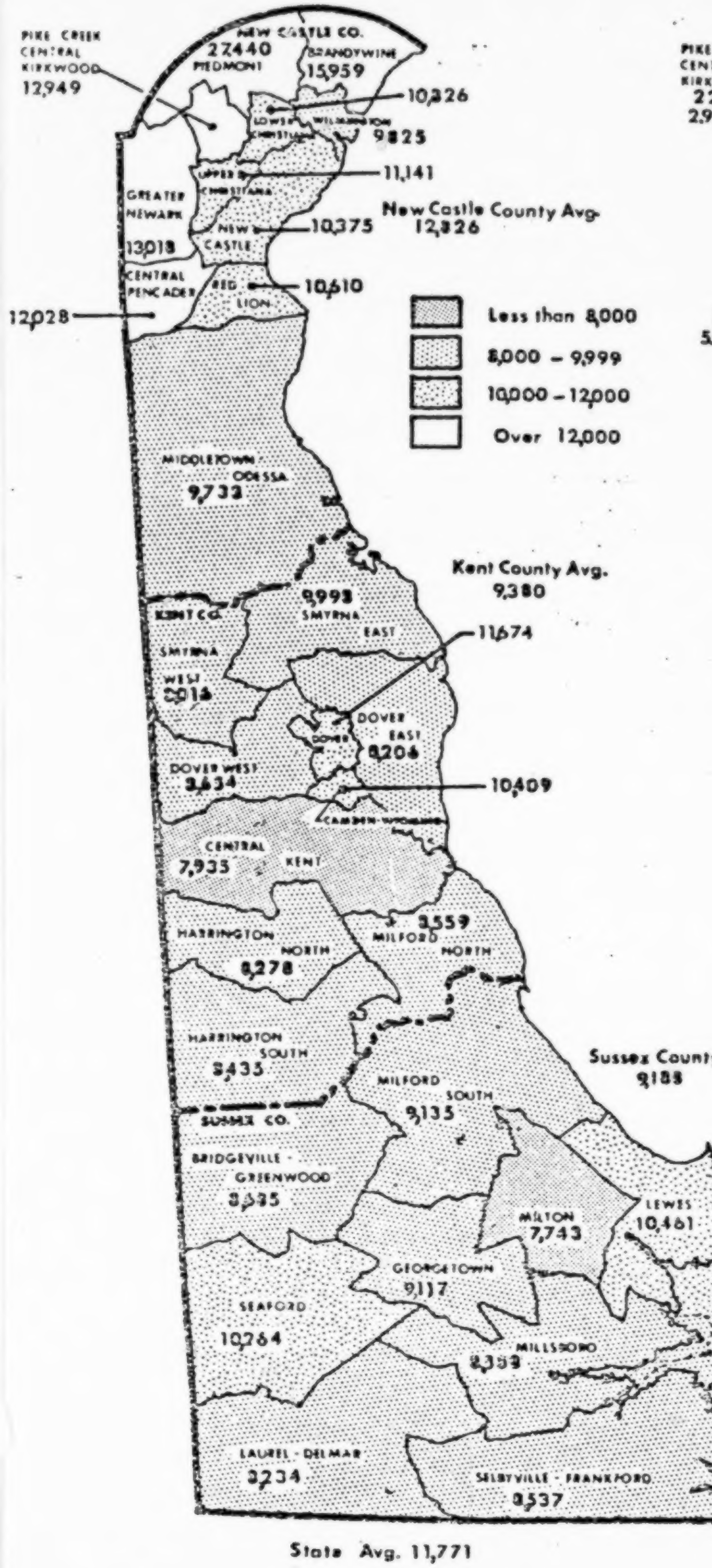
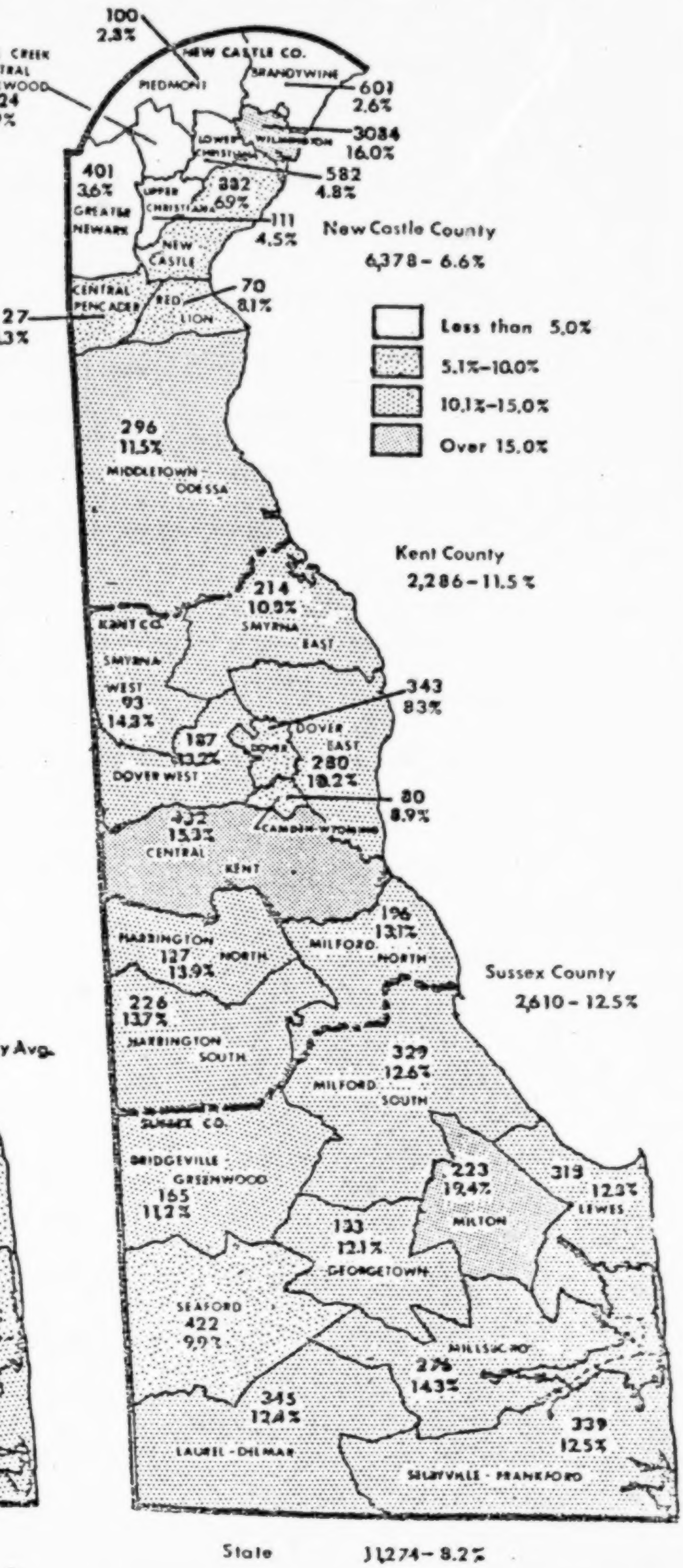


FIGURE 2-2

NUMBER AND PERCENT OF TOTAL FAMILIES LIVING BELOW POVERTY LEVEL, 1969

Source: Delaware State Planning Office



In 1969, 58,155 people, or 10.9% of the total population statewide, received incomes less than the poverty level. This represented 11,274 families or 8.2% of the total number. A further breakdown shows that 38,453 people or 7,192 of these families in Delaware had an income in 1969 less than 75% of the poverty level. Expressed another way, 7.0% of the total population or 5.3% of all families in the state lived in that year with an income of less than 75% of the poverty level. Finally, it is also noteworthy that a much higher proportion of our older citizens are in this category than the average for all age groups. Of the total population aged 65 and over, 24.1% were below the poverty level. A startling 49.4% of all unrelated individuals over 65 were in this category.

Sussex County had the highest proportion of families living under the poverty level at 12.5% followed by Kent at 11.5% and New Castle at 6.6%. Below the county level, Milton CCD had the highest percentage of families in poverty followed by Wilmington and Central Kent. Wilmington had by far the largest number of poor families of any of the CCD's.

Earnings by Occupation

The median earnings of males 16 years old and over in 1969 was $7,970. Those classified as professional, managerial, and kindred workers had a considerably higher average of $11,464. Median earnings for all females over 16 years old were $3,651 and the occupational group with the highest average for women was clerical and kindred workers at $4,324. Table 2 shows a detailed breakdown of median earnings by occupational group and also

TABLE 2-2

MEDIAN EARNINGS BY OCCUPATIONAL GROUP

	The State			Kent	New Castle	Sussex	Percent Difference Low-High
	Total	White	Negro				
Male, 16 years old and over with earnings	$ 7,970	$ 8,372	$ 5,118	$ 7,018	$ 8,471	$ 6,286	35
Professional, managerial, and kindred workers	11,464	11,661	7,960	9,374	12,030	9,032	33
Craftsmen, foremen, and kindred workers	8,286	8,504	5,605	7,424	8,780	6,659	32
Operatives, including transport	7,153	7,446	5,543	6,488	7,445	5,736	30
Laborers, except farm	4,535	4,749	4,271	4,650	4,774	3,962	20
Farmers and farm managers	5,174	5,309	-----	4,943	5,231	5,243	6
Farm laborers, except unpaid, and farm foremen	2,984	3,304	2,401	2,598	2,838	3,203	23
Female, 16 years old and over with earnings	3,651	3,851	2,856	3,598	3,772	3,344	13
Clerical and kindred workers	4,324	4,375	3,559	4,286	4,392	3,861	14
Operatives, including transport	3,480	3,632	3,073	3,516	3,620	3,342	8

Source: Delaware State Planning Office, Delaware Economic Indicator Quarterly, April, 1972, p. 11.

type of area. It can be noted that except for the two farm related groups, average incomes for each occupational category were highest in New Castle County and lowest in Sussex. The largest difference was in male professionals and managers where the average male worker received $3,000 more per year than his counterpart in Sussex.

Table 2 shows a spread of 35 percent differential between 16 year old males and over between New Castle and Sussex counties. As the skill required for the occupations becomes less the differential in salaries between the counties becomes less apparent. This does not hold true for farm laborers where we find a differential of 26 percent. Females, 16 years of age and over with earnings do not show the same spread in wages per occupational classification. Job opportunities are not as apparently available and salaries are not commensurate with male wages. When one observes this apparent difference in wages between counties these have implications for variations in the unit costs of providing educational services and facilities. Services for both teachers and for the school system vary in cost throughout the state. However, data are not available to measure these variations among the 22 school districts of Delaware. Cost of construction and other endeavors with a high percentage of labor input fluctuate to some extent throughout the state. This can be further substantiated by the data in Table 3.

Table 3 shows the prevailing wage rates for the basic building construction costs for the three counties. Again the cost differential exists between counties. School systems engaging in new school construction project

TABLE 2-3

BUILDING CONSTRUCTION LABOR COSTS

Kent	Kent Base Rate	New Castle Base Rate	Sussex Base Rate
Acoustical Tile Workers	$ 6.86	$ 7.70	$ 6.25
Foreman		8.40	
Asbestos Workers	7.75	8.95	6.81
Bricklayers	7.20	8.25	7.80
Foreman		8.50	
Carpenters	6.86	8.65	6.25
Foreman		9.35	
Cement Masons	5.12	7.14	5.68
Foreman		7.25	
Electrical Workers	6.27	9.04	6.76
General Foreman		9.79	
Foreman		9.49	
Sub-Foreman		9.165	
Glaziers	5.50	8.13	6.01
Iron Workers	8.00	8.17	7.57
General Foreman		9.17	
Foreman		8.67	
Lathers, Wood & Metal	7.35	7.35	6.35
Foreman		7.60	
Machine Movers & Riggers	8.10	7.15	
General Foreman		8.15	
Foreman		7.65	
Marble, Tile & Terrazzo	5.40	7.975	6.40
Foreman		8.225	
Millwright		9.37	
Foreman		10.12	
Painters	6.03	6.93	6.605
Foreman		7.43	
Painters-Bridge		7.43	
Foreman		7.93	
Plasterers	5.57	8.02	6.18
Foreman		8.27	
Plumbers	7.25	7.25	7.09
Foreman		7.98	
General Foreman		8.70	
Rodmen-Reinforeced Concrete	7.15	7.56	7.57
General Foreman		8.56	
Foreman		8.06	
Roofers-Composition	6.325	8.45	7.875
Foreman		8.675	
Helper	4.68		

TABLE 2-3 (Continued)

Kent	Kent Base Rate	New Castle Base Rate	Sussex Base Rate
Sheet Metal Workers	$ 6.18	$ 7.95	$ 8.38
General Foreman		9.14	
Foreman		8.59	
Steam Fitters	8.67	8.67	8.67
General Foreman		10.50	
Foreman		9.65	
Stone Mason	7.10	8.25	
Foreman		8.50	
Common	5.50	6.35	5.14
Flagman	5.50	6.35	5.14
Airpool Operators		6.60	
Asphalt Rakers	5.50	6.60	
Asphalt Spreaders		6.60	
Caisson: On Top			
In Hole			
Drillers		6.60	
Fine Graders		6.60	
Landscape Workers		6.60	
Mason Tenders	5.50	6.60	5.89
Motor Buggy Operators		6.60	
Mortor Mixers		6.60	
Pipe Layers (Slay, Con. & Drain)		6.60	
Plaster Tenders		6.60	5.30
Powdermen-Blasters		7.60	
Scaffold Builders	6.20	6.60	5.30
Tandem		5.10	5.18
Batch		5.10	5.18
Semi-Trailer		5.10	5.18
Mixer		5.10	5.18
Lowboy		5.10	5.18
Dump or Pick-Up		4.95	4.95
Euclid		5.20	5.39
Asphalt Distributor		5.10	5.25
Flat Bed		4.95	4.45

Source: Department of Labor, State of Delaware, October, 1972.

or renovation projects are faced with these labor cost differentials. Teachers building homes or other facilities are confronted by these differentiations in labor costs. These costs would affect the cost of delivering an educational program. Because of the wage differentiation schools competing in the existing labor pool will be influenced by the wages the system will need to pay to meet competition from other employers.

Table 4 shows some further socioeconomic measures that might influence the living costs of school employees. The average value of housing ranges from a high of $34,500 in the Alexis I. duPont district to a low of $12,000 in the Lake Forrest district. Average monthly rent ranges from a high of $150 per month in the Alfred I. duPont district to a low of $50 in the Indian River and Woodbridge districts. These data show the average cost of housing and average monthly rental in each school district but they do not show the differences in cost among the districts for the same quality of housing or differences in rent for the same quality of rental properties. Therefore, these data provide no evidence that the costs of delivering education varies among the school districts of Delaware because of differences in the average value of housing and average monthly costs of rent.

TABLE 2-4

SOCIOECONOMIC MEASURES

School District	Average Value Housing	Average Monthly Rent
Alexis I. duPont	$ 34,500	$ 110
Alfred I. duPont	32,750	150
Appoquinimink	17,000	60
Claymont	18,500	130
Conrad Area	15,400	100
De La Warr	13,000	85
Marshallton-McKean	23,250	125
Mount Pleasant	26,700	120
Newark	22,500	125
New Castle-Gunning Bedford	16,800	100
Stanton	22,000	130
Wilmington	12,500	90
Caesar Rodney	18,500	95
Cape Henlopen	19,500	70
Capital	20,000	100
Delmar	14,100	55
Indian River	15,000	50
Lake Forrest	12,000	60
Laurel	14,250	55
Milford	15,050	60
Seaford	18,500	65
Smyrna	16,000	70
Woodbridge	13,250	50

Source: Meslat Research, Inc., Social Indicators Report, May, 1972.

Tax Base

There is a considerable range in full value of real estate per pupil both intrastate and intracounty. See Table 5. The mean full value of real estate per pupil for the state is $21,815. In New Castle county the school district with the highest full value of real estate per pupil is Alexis I. duPont with a value of $52,777 and a relative ability index of 242 (100 = average district ability). De La Warr the lowest full value of real estate per pupil with a value of $13,798 and a relative ability index of 61. In Kent county the Capital school district has the highest value of $26,896 and a relative ability index of 118. Caesar Rodney has the lowest value per pupil of $14,508 and a relative ability index of 67. Cape Henlopen, in Sussex County has the highest value of $34,525 and a relative ability index of 158. Woodbridge has the lowest value of real estate per pupil with a value of $15,232 and a relative ability index of 70. New Castle shows a range of 173 in the ability index. Kent county shows a range of 46 in the ability index. Sussex county shows a range of 83 in the ability index. This table shows considerable disparity in local ability to support public education as measured by equalized valuation per pupil. The most wealthy district in Delaware has almost four times the equalized valuation per pupil of the least wealthy district. There is no evidence, however, that the same quality of education tends to cost more in the districts of greatest wealth than in the districts of least wealth. In the United States generally, education costs more in districts of greater wealth than in districts of less wealth, other things

TABLE 2-5

EQUALIZED ASSESSMENT PER PUPIL AND RELATIVE ABILITY OF DISTRICTS 1971-72
(BASED ON SEPTEMBER 30, 1971 ENROLLMENTS AND FULL VALUE OF REAL ESTATE)

District	Enrollments 9/30/72 Grades K-12 (1)	Full Value of Real Estate (2)	Full Value of Real Estate Per Pupil (3)	Relative Ability Index 100 = Average Dist. Ability (4)
NEW CASTLE COUNTY				
Alexis I. duPont	3,096	$ 163,396,150	$ 52,777	242
Alfred I. duPont	11,542	265,383,571	22,993	105
Appoquinimink	2,384	36,393,429	15,266	70
Claymont	3,912	82,201,714	21,013	96
Conrad Area	6,688	132,869,571	19,867	91
De La Warr	4,165	57,467,143	13,798	63
Marshallton-McKean	4,559	90,715,714	19,898	91
Mount Pleasant	5,838	161,528,000	27,668	127
New Castle-G. Bedford	9,267	174,799,429	18,863	86
New Castle Co. Voc-Tech[a]	1,219			
Newark	15,788	286,463,571	18,144	83
Stanton	6,171	105,493,714	17,095	78
Wilmington	15,327	423,895,610	27,656	127
TOTALS	89,956	1,980,607,616	22,018	
KENT COUNTY				
Caesar Rodney	6,068[b]	88,031,833	14,508	67
Capital	7.032	181,283,500	25,780	118
Lake Forest	3,462	54,282,833	15,680	72
Milford	4,120	73,277,857	17,786	82
Smyrna	3,019	58,131,714	19,255	88
TOTALS	23,701[b]	455,007,737	19,198	
SUSSEX COUNTY				
Cape Henlopen	3,806	131,403,956	34,525	158
Delmar	672	15,413,950	22,937	105
Indian River	6,431	168,437,362	26,191	120
Laurel	2,231	36,696,844	16,449	75
Seaford	3,917	78,591,496	20,064	92
Woodbridge	2,213	33,708,839	15,232	70
TOTALS	19,270	464,252,447	24,092	
STATE TOTALS	132,927[b]	$2,899,867,800	$ 21,815	

---

[a] The vocational schools are authorized by law to assess the taxable property of the entire county up to 3 cents on $100 of assessed valuation.

[b] Figures do not include enrollments for Dover Air Force Schools, 2086.

Source: Planning, Research, and Evaluation Division, Department of Public Instruction.

being equal. However, these higher costs are principally due to the fact that the wealthy districts can spend more per pupil by making the same or even less tax effort in relation to ability than the less wealthy districts. Some of these extra costs are also probably due to the "life style" and aspiration level of the school patrons in the districts of greatest wealth.

Delaware is rather unique in that the state bids all educational supplies and materials. Any district can order on the basis of the state bid or if they can solicit a lower bid individually, they can negotiate their own purchase price. Because of this procedure, operational costs other than personnel cost should be rather stable throughout the state.

The state handles all bond sales in a rather unique way. All bonds are marketed through the state with the full economic base of the state serving as a credit base for the bonds. The state allots each district its building funds at the time that constuction is initiated. The state then groups the many different bond offerings and markets them at a time that appears advantageous for a lower interest rate.

VARIATIONS IN CERTAIN ITEMS OF CURRENT EXPENSE.

Table 6 shows a summary of per pupil expenditures of Delaware school districts for administration, instruction, attendance and health, plant operation, plant maintenance and fixed charges. Expenditures for transportation and school food service are excluded from this table because they are not a part of the regular educational program but auxiliary to it. Furthermore, the percent of the pupils transported and the percent of the

TABLE 2-6

CURRENT EXPENSES (EXCLUDING TRANSPORTATION AND FOOD SERVICES) BY DISTRICT AND AVERAGE DAILY MEMBERSHIP 1970-71

District	Adminis-tration	Instruction	Attendance & Health	Plant Operation	Plant Main-tenance	Fixed Charges	Total
NEW CASTLE COUNTY							
Alexis I. duPont	$ 66.43	$ 759.99	$ 13.17	$ 135.16	$ 34.82	$ 12.25	$1,021.82
Alfred I. duPont	37.13	727.41	13.08	99.35	12.29	10.89	900.15
Appoquinimink	69.09	629.05	11.64	91.14	32.82	2.58	836.32
Claymont	33.56	570.09	12.33	103.20	35.28	4.77	759.23
Conrad	49.73	578.00	8.42	37.13	58.66	8.63	740.57
De La Warr	36.14	575.09	11.87	77.56	20.82	6.80	728.28
Marshallton-McKean	59.43	638.70	11.94	88.72	33.66	11.09	843.54
Mount Pleasant	32.80	665.47	11.91	77.14	36.19	8.97	832.48
New Castle-Gunning Bedford	36.23	577.74	9.64	70.27	25.04	10.10	729.02
Newark	32.60	587.56	9.74	35.55	56.86	10.92	733.23
Stanton	52.00	602.25	10.54	92.87	17.07	13.65	788.38
Wilmington	53.94	881.63	19.82	91.20	36.67	22.81	1,106.07

TABLE 2-6 (Continued)

District	Adminis-tration	Instruction	Attendance & Health	Plant Operation	Plant Main-tenance	Fixed Charges	Total
KENT COUNTY							
Caesar Rodney	$ 38.05	$ 509.58	$ 8.04	$ 75.62	$ 11.27	$ 3.16	$ 645.72
Capital	34.06	570.48	9.53	74.49	25.18	8.66	722.40
Lake Forest	38.00	531.56	7.96	85.16	42.32	4.28	709.28
Milford	51.88	530.99	9.77	68.18	16.53	5.07	682.42
Smyrna	21.96	548.75	13.66	74.52	21.04	4.90	684.83
SUSSEX COUNTY							
Cape Henlopen	32.13	595.72	11.40	80.07	21.53	4.90	745.75
Delmar	85.28	519.18	12.92	104.21	16.50	4.48	742.57
Indian River	30.96	512.71	11.68	68.22	14.80	2.51	640.88
Laurel	45.38	579.56	12.90	78.09	16.80	2.81	735.54
Seaford	36.73	545.79	11.05	69.78	45.78	3.32	722.45
Woodbridge	25.50	467.75	5.92	72.79	16.47	.66	599.09

budget allocated to transportation varies from district to district due principally to factors beyond the control of the district. The six functions of current expenditure included in Table 6 should be relatively comparable among the districts of Delaware with the exception of school plant maintenance which may vary from year to year due to the age and condition of buildings.

Table 6 shows a range of per pupil expenditures in 1970-71 for six functions of current expense from $640.88 in Indian River and $645.72 in Caesar Rodney to $1,106.07 in Wilmington and $1,021.82 in Alexis I. duPont. The expenditure for these items of current expense was 1.7 times as much in Wilmington as in Indian River and 1.6 times as much in Alexis I. duPont as in Caesar Rodney. Are there differences in pupil expenditure for delivering educational services due to factors beyond the control of the board of education or are they due to differences among the districts in per pupil wealth? A casual inspection of the data in Tables 6 and 5 shows that the districts with the highest per pupil expenditures are also generally the districts with the highest equalized valuation. Teh coefficient of correlation between per pupil expenditures shown in Table 6 and per pupil full value of real estate shown in Table 5 was .68. This is a fairly high correlation because it explains almost half of the variations in per pupil expenditures. Variations in local tax effort are measured by computed tax rates on the equalized valuation. Table 7 shows that Wilmington in 1970-71 had a current expense tax rate of $1.074 on $100 of full value of real estate, Indian River, $.391, Alexis I. duPont, $.819 and Caesar Rodney, $.277. Therefore, it seems in Delaware that pupils

TABLE 2-7

TAX RATE FOR CURRENT EXPENSE ON $100 OF FULL VALUE OF REAL ESTATE 1970-71

District	Tax Rate Per $100 Full Value of Property
NEW CASTLE COUNTY	
Alexis I. duPont	$ .819
Alfred I. duPont	1.043
Appoquinimink	.913
Claymont	.945
Conrad Area	.84
De La Warr	.742
Marshallton-McKean	1.106
Mount Pleasant	.924
New Castle-G. Bedford	.805
Newark	.976
Stanton	1.134
Wilmington	1.074
KENT COUNTY	
Caesar Rodney	.277
Capital	.456
Lake Forest	.557
Milford	.325
Smyrna	.358
SUSSEX COUNTY	
Cape Henlopen	.676
Delmar	.362
Indian River	.391
Laurel	.331
Seaford	.356
Woodbridge	.401
COUNTY VOCATIONAL DISTRICTS	
New Castle	.020
Kent	.018
Sussex	.015

Source: Department of Public Instruction, Delaware Report of Educational Statistics 1970-71, p. 48.

in some of the more wealthy districts not only have the advantage of the greater wealth of their parents but they also have the advantage of greater tax effect due perhaps to the higher aspiration level of their parents.

Table 8 shows the correlation between the total current expenditures for current expense and certain other items. This table is very revealing.

TABLE 2-8

CORRELATION BETWEEN CURRENT EXPENDITURES
PER PUPIL AND CERTAIN OTHER ITEMS

Item	Correlation with Current Expenses per Pupil
Per Pupil Expenditures for Administration	.47
Per Pupil Expenditures for Plant Operation	.54
Per Pupil Expenditures for Fixed Charges	.80
Per Pupil Expenditures for Instruction	.97
Per Pupil Full Value of Real Estate	.68
Per Pupil Assessed Valuation of Real Estate	.70
Mean Income Per Tax Return	.64
Average Teacher's Salary	.76

It shows that variations in the cost of education per pupil in Delaware are primarily due to variations among the districts in wealth. The correlation of per pupil current expenditures with per pupil full value is .58; with per pupil assessed value .70 and with mean value of income tax return .64. Furthermore, all items of current expense listed in Table 8 are correlated with total current expenditures per pupil. This indicates that the wealthy districts pay higher teacher salaries than the less wealthy districts and that they also spend more per pupil on other functions of expenditure than the less wealthy districts.

TABLE 2-9
NUMBER OF TRANSPORTED STUDENTS PER SQUARE MILE AND PER PUPIL COST OF TRANSPORTATION 1970-71

District	Transported Pupils Per Square Mile	Per Pupil Cost of Transportation
NEW CASTLE COUNTY		
Alexis I. duPont	76.56	$ 71.84
Alfred I. duPont	298.65	61.61
Appoquinimink	12.41	109.58
Claymont	107.53	25.61
Conrad	258.01	24.32
De La Warr	282.11	66.98
Marshallton-McKean	339.56	63.74
Mount Pleasant	355.49	49.90
New Castle-Gunning Bedford	90.58	52.39
Newark	172.66	85.65
Stanton	171.75	86.03
Wilmington	154.21	75.97
TOTAL		68.34
KENT COUNTY		
Caesar Rodney	39.91	68.00
Capital	38.18	65.92
Lake Forest	16.10	68.14
Milford*	38.63	75.86
Smyrna*	14.22	84.60
TOTAL		71.06
SUSSEX COUNTY		
Cape Henlopen	13.74	81.88
Delmar	15.31	82.31
Indian River	14.55	73.24
Laurel	14.46	71.45
Seaford	32.64	77.05
Woodbridge**	14.14	86.03
TOTAL		77.98
Total State		$ 71.06

* Data listed for Milford, and Smyrna pertain to the area in Kent County only.

** Data listed for Woodbridge pertain to the area in Sussex County only.

Source: Department of Public Instruction, Delaware Report of Educational Statistics, 1970-71 and other data furnished by the Department.

Table 9 shows the number of transported pupils per square mile in each district and the per pupil cost. It will be noted that the cost per pupil ranged from $24.32 in Conrad Area to $109.58 in Appoquinimink. However, the density of transported pupils per square mile was 282.11 in Conrad Area and 12.41 in Appoquinimink. The variations in per pupil costs of transportation in Delaware are due principally to variations in the density of transported pupils. Generally speaking, the greater the density of transported pupils the less the per pupil cost and the less the density the greater the per pupil cost. This is a factor beyond the control of the board of education. The state of Delaware already provides for these variations in cost because the cost of approved transportation is fully funded by state funds.

CONCLUSIONS

The evidence presented in this study does not justify the development of a cost of delivering educational services index for each district to use in apportioning state school funds. Data are not available for each district for the development of such an index nor are data available by which variations among the districts in the cost of living could be determined. Variations do exist among the districts in per pupil expenditures for administration, instruction, attendance and health, plant operation, plant maintenance and fixed charges; but these variations are principally due to variations among the districts in the per pupil wealth and variations in local tax effort in proportion to ability.

There are some variations among the districts in the unit costs of delivering some types of educational services but these variations are not all in the same direction for different objects of expenditure. For example, the per pupil cost of land for schools is greater in the urban districts than in rural districts but the per pupil cost of transportation is greater in rural districts than in urban districts. The hourly cost of skilled labor may be greater in some urban districts than in the rural districts but when the skilled labor has to travel from an urban district to a rural district to construct a building or repair it, the cost of building construction and maintenance in a rural district may actually be greater. Therefore, it does not seem rational to attempt to develop an overall cost of delivering educational index for each school district. However, there are variations in the unit costs for certain objects and functions of school expenditure and as the state approaches full state funding, these variations will need to be recognized. As a matter of fact, the state is already doing so for a number of items. Following is a summary of the state's policies with respect to recognizing variations in the unit costs of delivering educational services along with some suggestions for further extending those policies.

1. Teacher Salaries. The Delaware state salary schedule recognizes differences in the training and experience of teachers. Boards of education generally throughout the United States provide differentials in their salary schedules based on training and experience. However, the Delaware state salary schedule is so low

that local boards are required to supplement the state salary schedule in order to pay teachers' salaries competitive with surrounding states. This places districts with low per pupil valuation of property at a disadvantage. Therefore, in order to place all districts on an equal basis in competing for high quality teachers, the state salary schedule should be increased sufficiently to make it competitive with neighboring states.

The state finance plan allots teachers for whom the state salary schedule is applied in terms of pupil units which provide for varying pupil-teacher ratios. These variations in pupil-teacher ratios are based upon variations in the pupil-teacher ratios customarily required to provide the service. For example, one unit is provided for each 25 elementary pupils grades 1-6; one unit for each 20 pupils in grades 7-12, one unit for each 15 mentally handicapped pupils, one unit for 15 equivalent full time vocational pupils, one unit for each eight partially blind pupils, etc. These pupil units are customarily called teacher units or instruction units in other states because they correspond with the computed number of teachers needed to deliver the service for a given number of pupils which vary in their needs. This policy of providing different pupil-teacher ratios for pupils with varying needs or weighting pupils in accordance with necessary unit cost variations is followed in all advanced programs of state support.

There is no evidence available that shows that the cost of living for the same standard of living varies substantially among the districts of the state.

2. Administration and Supervision Salaries. The state provides a salary schedule for these salaries. Local boards of education also supplement these salaries and this places low wealth districts at a disadvantage. This disadvantage can be removed by making the state salary schedule for administration competitive with surrounding states.

3. Salaries of Clerks, Nurses, Custodians and School Lunch Managers. State salary schedules for apportioning state funds for these personnel are also provided. No data are available that show that salary schedules for these services must vary among the districts in order to provide the services.

4. Current Expense Costs Other than Salaries and Transportation. In 1971-72, the state allotted $1,120 per pupil unit for this purpose to all units except for vocational units. Varying amounts were allotted per pupil unit for vocational education in accordance with need. The amount per pupil unit for vocational education averaged about 2.8 the amount allotted for other units.

   The State Department of Public Instruction makes annual studies of the cost of items financed from this allocation. An index of the cost of current expense other than salaries and transportation is computed for each year and the percentage increase of pupil unit costs of each year over the previous year is computed. This forms the basis for making requests of the legislature for the appropriation per pupil unit for current expenses other than salaries and transportation. These studies provide a sound basis for making these requests.

5. School Construction. The state provides 60 percent of the cost of approved construction and 40 percent is provided by local school districts. This, of course, places districts with a low valuation for pupil at a disadvantage in providing for school facilities. The cost per square foot for similar types of construction may vary around the districts due to local variations in wage scales, the cost of school sites, the distance labor and materials are transported and perhaps other factors. These variations should all be included in approved costs. However, equitable provision for all of these variations can be attained only by full state funding of approved costs.
6. School Plant Maintenance. The state funds 100 percent of the approved costs of school plant maintenance. This is a sound policy because the cost per pupil for school plant maintenance varies greatly among the districts due to variations in the age and condition of buildings and variations in wage scales.
7. School Transportation. The per pupil cost of transportation varies greatly among the districts due principally to variations in the density of transported pupils per square mile. The state funds 100 percent of the approved costs of transportation thereby takes care of necessary variations in the unit costs of providing for school transportation services. This is a sound policy.
8. Equalization Appropriation. The state provides two equalization appropriations which together total only approximately $3,600,000

> in 1972-73. This is only approximately 3.0 of total state appropriations. It is entirely too small an appropriation to equalize the financial resources of the school districts of Delaware. The financial resources of the school districts of Delaware can be equalized only by full state funding or increasing the equalization appropriation sufficiently to equalize the financial resources of all districts to provide the educational services needed.

In conclusion, the costs of delivering education in Delaware can be met only by: (a) making adequate provision in the state financing plan for necessary unit cost differentials for delivering an equivalent quantity and quality of educational programs, services and facilities in all school districts of the state, (b) fully funding from state or federal funds the total cost of the educational program needed or substantially equalizing the financial resources of all school districts to meet these needs from a combination of state, local and federal funds.

SECTION 3

STATUS OF DELAWARE PUBLIC SCHOOL PERSONNEL, 1971-1972

James Jones, Temple University,
Walter Haworth, Graduate Assistant, Temple University,
William B. Castetter, University of Pennsylvania and
James T. Kurashige, Graduate Assistant, University of Pennsylvania

The purpose of this analysis is to provide facts, observations, and insights concerning the contemporary status of Delaware public school personnel. More specifically, the following questions will be examined:

1. What are the salient characteristics of public education in Delaware?

2. What trends are developing in the composition of Delaware public school personnel? In the economic status? In the supply and demand for school personnel? In the preparation and certification of public school personnel?

4. What are the key problems and opportunities for positive developments in the teaching profession in Delaware?

The text following deals *en seriatim* with the foregoing questions. The focus of the discussion is on the current status of public school personnel, unresolved problems relating to their economic welfare, and forces, factors, and conditions which are contributing to social and economic conditions and changes in Delaware public education.

PROFILE OF PUBLIC EDUCATION IN DELAWARE

Table 1 summarizes statistically some of the key factors affecting public education in Delaware and the manner in which these factors have changed during the five-year period, 1966-71. These observations provided by the data in Table 1 are noteworthy:

1. Pupils in average daily membership have increased about 20 percent during the five-year period, from 109,643 pupils in 1966-67 to 131,422 in 1970-71.

2. Instructional personnel have increased almost 29 percent; administrative personnel by 80 percent.

3. The number of school administrative units have been cut in half, a decrease from 51 units in 1966 to 26 units in 1970-71.

4. The total cost of public education in Delaware amounted to 181 million in 1970-71, an increase of about seventy percent over a five-year period.

5. Salaries for instructional personnel increased 68 percent; administrative personnel about 128 percent.

6. Average salaries for instructional personnel have risen about 30 percent; from $7,804 in 1966 to $10,212 in 1970-71. Average salaries of administrative personnel have increased from $14,610 to $18,512, a gain of 26 percent.

7. Per pupil costs have increased about 42 percent; bonded debt about 15 percent; bonded debt per pupil has decreased about 3.7 percent.

8. The key changes shown for the variables in Table 1 are those relating to salaries of all school personnel. While the number of Delaware pupils in average daily membership has increased about 20 percent between 1966-71, the number of school personnel has increased about thirty percent; personnel salary costs have risen about seventy percent; average salaries for all school personnel have risen about thirty percent.

9. Salient increases have been recorded in total expenditures for public education in Delaware (about 70 percent), while the number of school administrative units have shown a decrease of about 96 percent.

10. The number of school administrative personnel as well as the salaries they are paid have increased sharply. The number of administrative personnel has increased by 80 percent; administrative salaries by 128 percent.

TABLE 3-1

PROFILE OF PUBLIC EDUCATION IN DELAWARE, 1966-71

Component	1966-67	1967-68	1968-69	1969-70	1970-71	% Change 66-67 to 70-71
Pupils						
Average daily membership, K-12*	109,643	114,524	123,340	129,345	131,422	19.86
High school graduates	6,150	6,167	6,868	7,178	7,576	23.18
Personnel						
Instructional	5,280	5,430	5,786	6,390	6,795	28.69
Administrative	92	105	113	152	166	80.43
Total	5,372	5,535	5,899	6,542	6,961	29.57
Administrative units	51	50	48	26	26	-96.15
Buildings	183	189	195	198	202	10.38
Expenditures						
Current	$ 68,135,579	$ 74,715,807	$ 84,721,677	$101,271,867	$116,328,089	70.73
Capital outlay and debt	37,003,792	33,638,541	39,868,151	51,772,469	62,903,840	69.99
Other	634,589	1,656,392	2,794,322	2,763,500	1,905,629	200.29
Total expenditures	105,773,960	110,010,740	127,384,150	155,807,836	181,137,558	71.25
Salaries - Local dsitricts						
Instructional and administrative personnel	$ 42,549,240	$ 44,984,730	$ 52,049,870	$ 62,529,776	$ 72,463,148	70.30
Instructional	41,205,120	43,407,420	50,210,908	59,985,530	69,390,152	68.40
Administrative	1,344,120	1,577,310	1,838,962	2,544,246	3,072,996	128.62
Average Salaries - Local districts						
Instructional and administrative personnel	$ 7,921	$ 8,127	$ 8,824	$ 9,558	$ 10,410	31.42
Instructional	7,804	7,994	8,678	9,387	10,212	30.85
Administrative	14,610	15,022	16,274	16,738	18,512	26.70
Per pupil cost (Current ADM)	$ 621	$ 652	$ 687	$ 783	$ 885	42.51
Bonded Debt	$ 64,190,030	$ 67,180,721	$ 70,375,230	$ 70,256,858	$ 74,127,474	15.48
Bonded Debt Per Pupil ADM	$ 585	$ 587	$ 571	$ 543	$ 564	-3.72

*Kindergarten figures included for this first time in 1968-69.

Source: State of Delaware, Report of Educational Statistics, 1970-71, (Dover, Delaware: The State Board of Education and the Department of Public Instruction, 1971), 1-2.

DELAWARE'S RANKING AMONG FIFTY STATES

Table 2 contains statistics relating to Delaware's rank in the fifty states on various educational and related variables over the past decade. Analysis of these data provides the following observations which provide insights relative to the basic questions being examined in this report.

1. While Delaware ranks in the lowest quartile among the fifty states in school age population, it is close to the median when the school age population is compared to the percent of total population.

2. While Delaware is among the lowest ranking states in terms of pupil enrollment, the percent of public school enrollment in the school age population has changed dramatically over the past decade--from a ranking of 46th among the states in 1961 to 18th in 1971.

3. The average salary of Delaware public school teachers, while increasing from $5,789 in 1961 to $9,725 in 1971, has decreased over the decade in state rankings--from 8th in 1961 to 12th in 1971. This trend is also true for the average salary of Delaware instructional staff members over the past decade. In 1961 the average salary for instructional personnel was $5,900; in 1971, $10,157. While the relative gain is considerable, Delaware's ranking among the fifty states on this variable has slipped from tenth to thirteenth.

4. The relative change in Delaware's position among the fifty states over the past decade on variables affecting public education develops into a consistent pattern when the total series of variables in Table 2 is analyzed. The state has dropped from first to third in the percent of public school revenue derived from the state government; from first to tenth in per capita personal income; risen 48th to 45th in rank on public school revenues derived from local government; dropped from first to fourth in per capita state expenditures for all education. The ranking of Delaware on current expenditures per pupil over the past decade has remained the same, even though the per pupil expenditure has more than doubled.

5. The net impression gleaned from the data in Table 2 is that although sharp increases have been made in variables related to public education in Delaware, progress in other states, relatively speaking, has been greater. Selected statistics shown below on key variables concerning educational change in Delaware illustrate the point.

TABLE 3-2

DELAWARE'S RANK IN THE FIFTY STATES ON VARIOUS EDUCATIONAL AND RELATED STATISTICS OVER THE PAST DECADE

Item	Year	Number, Amount, or Percent	National Rank	Year	Number, Amount, or Percent	National Rank	Year	Number, Amount, or Percent	Natio Rank
I. POPULATION									
1. Estimated School-Age Population (5-17)	1961	113,106	45	1966	140,000	46	1971	148,000	46
2. Estimated School-Age Population (5-17) as Percent of Total Population.	1960	26.2	23	1966	27.3	17	1971	27.7	16
3. Percent of Population Aged 65 or Older	1960	8.0	36	1966	7.8	38	1970	8.0	41
4. Percent of Population That is Urban	1960	65.7	22	1965	65.6	22	1970	72.2	19
II. ENROLLMENT AND ATTENDANCE									
5. Public-School Enrollment, Fall	1961	86,908	46	1966	112,780	46	1971	135,013	46
6. Public School Enrollment as Percent of School Age Population	1961	76.8	46	1966	80.6	38	1971	91.2	18
III. TEACHERS									
7. Estimated Average Salaries of All Teachers in Public Schools	1960-61	5,789	8	1965-66	7,082	7	1970-71	9,725	12

TABLE 3-2 (Continued)

Item	Year	Number, Amount, or Percent	National Rank	Year	Number, Amount, or Percent	National Rank	Year	Number, Amount, or Percent	Natio Rank
8. Estimated Average Salaries of Instructional Staff in Public Schools	1960-61	5,900	10	1965-66	7,300	6	1970-71	10,157	13
IV. EDUCATIONAL ATTAINMENT									
9. Median School Years Completed by Persons 25 Years Old and Older	1950	9.8	20	1955	N/A	N/A	1960	11.1	18
V. GENERAL FINANCIAL RESOURCES									
10. Per-Capita Personal Income . . .	1960	$3,013	1	1965	$3,392	2	1970	$4,324	10
VI. SCHOOL REVENUE									
11. Estimated Percent of Revenue for Public Elementary and Secondary Schools from Local Government	1960-61	18.4	48	1965-66	18.9	50	1970-71	22.0	45
12. Estimated Percent of Revenue for Public Elementary and Secondary Schools from State Government	1960-61	79.6	1	1965-66	75.5	1	1970-71	70.8	3
13. Estimated Percent of Revenue for Public Elementary and Secondary Schools from the Federal Government	1960-61	2.0	45	1965-66	5.7	44	1970-71	7.2	29

TABLE 3-2 (Continued)

Item	Year	Number, Amount, or Percent	National Rank	Year	Number, Amount, or Percent	National Rank	Year	Number, Amount, or Percent	Natio Rank
VII. SCHOOL EXPENDITURES									
14. Per Capita State Expenditures for All Education	1960	$114.12	1	1965	$179.66	2	1970	$259.28	4
15. Estimated Current Expenditures for Public Elementary and Secondary Schools Per Pupil in ADA	1961-62	475	7	1966-67	629	7	1971-72	1,097	7

Source: Department of Public Instruction, Delaware's Rank in the Fifty States on Various Educational and Related Statistics. (Dover, Del.: Planning, Research and Evaluation Division, 1972), 9-11.

Item	Delaware 1960	Rank	Delaware 1971	Rank	Change in Relative State Position
Average Salaries of Public School Teachers	$ 5,789.00	8	$ 9,725.00	12	- 4
Per Capita Personal Income	3,013.00	1	4,324.00	10	- 9
Percent Revenue from Local Government	18.4	48	22.0	45	+ 3
Percent Revenue from State Government	79.6	1	70.8	3	- 2
Percent Revenue from Federal Government	2.6	45	7.2	29	+16
Per Capita State Expenditures for Education	114.12	1	259.28	4	- 3
Estimated Current Expenditures Per Pupil	475.00	7	1,097.00	7	0
Median School Years Completed by Persons 25 Years Old and Older (1950-66)	9.8	20	11.1	18	- 2

ECONOMIC ASPECTS OF DELAWARE PUBLIC SCHOOL PERSONNEL

In the text following we shall examine data which have a bearing on the economic status of public school personnel in the state of Delaware. This includes the relative ranking of salaries paid to Delaware public school personnel, the salary patterns in the ten largest and smallest school districts in Delaware, as well as the movement of some of the variables affecting the economic welfare of Delaware personnel over a long-term period.

Number of Classroom Personnel

Exhibit 1 contains data which illustrate the growth in the number of classroom teachers in Delaware over a forty-year period. The total number of classroom teachers, as indicated in Exhibit 1, has increased from 1,511 in 1930-31 to 6,034 in 1970-71, a gain of 299.3 percent. The increase of the number fo classroom personnel by decades is shown below:

Year	Change in Number	Percent of Change
1930-1940	+ 209	13.8
1940-1950	+ 217	12.6
1950-1960	+1,576	81.3
1960-1970	+2,521	71.8
1930-1970	+4,523	299.3

From the foregoing data it is clear that the demand for public school teachers in Delaware has escalated over the past two decades, with a slight tapering off of this demand during 1960-70.

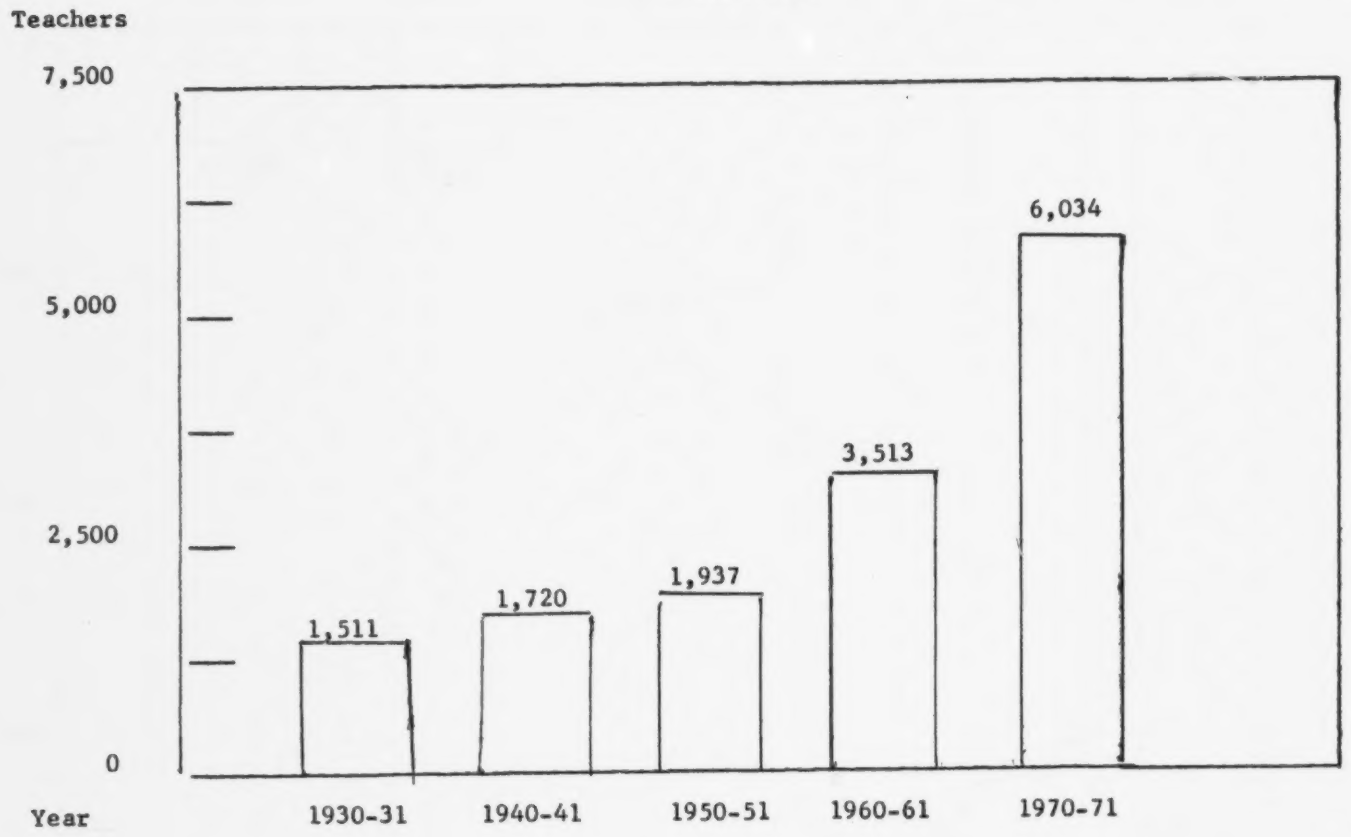
Salaries of Classroom Teachers

Salaries of classroom teachers in Delaware over the past decade are illustrated in Exhibit 2. Examination of these data bring out the following observations:

1. Salaries of classroom teachers (average) in Delaware have risen from $1,503 in 1930-31 to $10,211 in 1971-72, a gain of 579.37 percent.
2. The increase in average salaries by decades is illustrated in the following figures:

EXHIBIT 3-1. CLASSROOM TEACHERS IN DELAWARE PUBLIC SCHOOLS

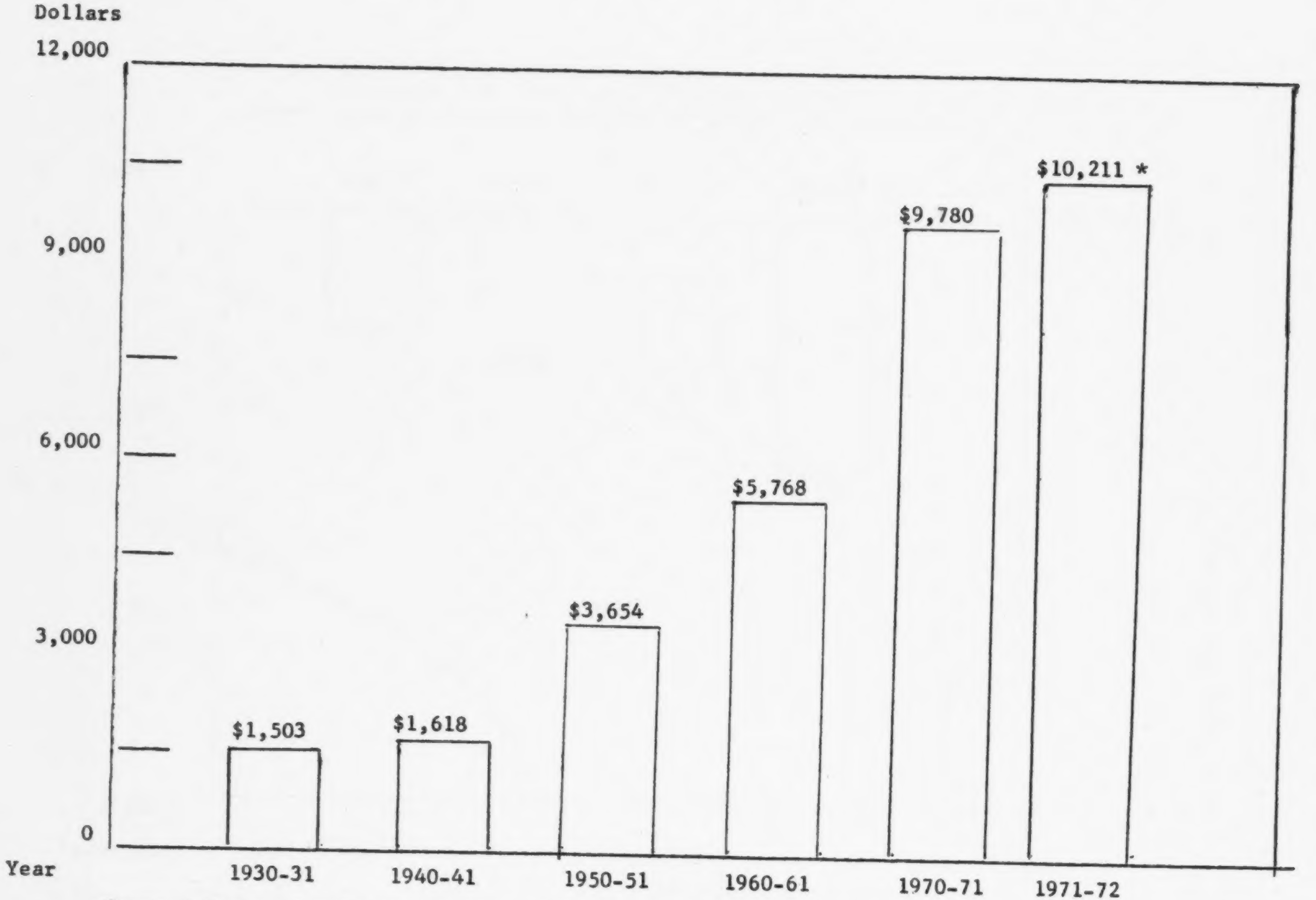
1930-1970



Source: State of Delaware, Report of Educational Statistics, 1970-71. (Dover, Delaware: The State Board of Education and The State Department of Public Instruction, 1971), 3.

EXHIBIT 3-2. AVERAGE SALARIES CLASSROOM TEACHERS IN DELAWARE

1930-1971



Source: State of Delaware, Report of Educational Statistics 1970-71. (Dover, Delaware: The State Board of Education and The State Department of Public Instruction, 1971), 4.

*Source for 1971-72 data: National Education Association, Research Report 1972-R1, Rankings of the States, 1972. (Washington, D.C.: NEA, 1972), 25.

Year	Amount of Change in Average Salary	Percent of Change
1930-31 to 1940-41	$ 115	+ 7.6
1940-41 to 1950-51	2,036	+ 125.8
1950-51 to 1960-61	2,114	+ 57.8
1960-61 to 1970-71	4,012	+ 69.6
1970-71 to 1971-72	431	+ 4.4
1930-31 to 1970-71	$ 8,708	+ 579.37

The gains in annual salaries for Delaware classroom teachers shown above typify the change over the decades in teachers' salaries generally.

Comparative Economic Status of Delaware Public School Personnel

Table 3 has been included to illustrate the comparative economic status of Delaware public school personnel. The data compare statistics for Delaware with those of Pennsylvania, Maryland, New Jersey, and U.S.A. The intent of this analysis is to determine the competitive position of Delaware in terms of selected economic variables.

Analysis of the data contained in Table 3 indicates the following noteworthy facts:

1. Delaware ranks lower than two of the three neighboring states in average salaries paid to elementary teachers, secondary teachers, and to all teachers.
2. Delaware ranks lowest among the four states in the percent of increase in instructional staff salaries, and lags behind in percent of salary increases for the nation as a whole.

TABLE 3-3

COMPARATIVE PROFILE OF PUBLIC EDUCATION IN DELAWARE AND IN THE FIFTY STATES

Item	Delaware		Maryland		New Jersey		Pennsylvania		U.S.A.
	Number, Amount, or Percent	National Rank	Number, Amount, or Percent	National Rank	Number, Amount, or Percent	National Rank	Number, Amount, or Percent	National Rank	Number, Amount, or Percent
I. Population									
1. Estimates of total population April 1, 1970	548,104	46	3,922,399	18	7,168,164	8	11,793,909	3	203,184,896
2. Percent change in total population, 1960-70	22.8	8	26.5	6	18.2	14	4.2	41	13.3
3. Estimated school-age population, July 1, 1971	148,000	46	1,033,000	19	1,789,000	8	2,909,000	4	52,266,000
4. Estimated school-age population as percent of total population, 1971	27.0	16	26.3	23	25.0	43	24.7	46	25.7
II.Enrollment and Attendance									
5. Number of basic administrative units, 1971-72	26	4	24	3	602	40	569	39	16,920
6. Public school enrollment, fall, 1971	135,013	46	930,990	18	1,520,539	8	2,372,500	5	46,168,540
II.Teachers									
7. Total instructional staff (full-time equivalency) in local public schools, Oct. 1970	7,320	46	43,890	18	82,524	8	121,859	5	2,349,049
8. Pupils per teacher in public elem. and secondary schools, fall, 1970	22.0	23	22.5	28	20.5	10	22.1	24	22.3
9. Estimated average salaries of all teachers in public schools, 1971-72	10,211	12	10,463	8	10,772	5	9,900	16	9,690
10. Percent of public school teachers paid $9,600 or more, 1971-72	57.3	13	61.2	6	60.0	8	60.0	8	46.6
11. Estimated average salaries of instructional staff in public schools, 1971-72	10,664	13	11,128	6	11,350	5	10,300	16	10,146
12. Percent increase in instructional staff salaries, 1961-62 to 1971-72	69.2	40	78.3	26	80.6	21	79.7	23	78.0
13. Percent increase in instructional staff salaries, 1970-71 to 1971-72	5.0	20	4.3	32	7.5	4	6.9	7	4.6

TABLE 3-3 (Continued)

Item	Delware		Maryland		New Jersey		Pennsylvania		U.S.A.
	Number, Amount, or Percent	National Rank	Number, Amount, or Percent	National Rank	Number, Amount, or Percent	National Rank	Number, Amount, or Percent	National Rank	Number, Amount, or Percent
V. Educational Attainment									
14. Percent increase in number of public high school grads, 1965-66 to 1970-71	27.3	4	16.0	18	10.9	33	10.5	36	12.7
V. General Financial Resources									
15. Per capita personal income, 1970	4,324	10	4,255	11	4,598	3	3,927	15	3,921
I. School Revenue									
16. Public school revenue receipts per pupil in ADA, 1971-72	1,338	7	1,400	5	1,443	4	1,268	11	1,094
17. Estimated percent of revenue for public elem/sec. schools from local government, 1971-72	23.5	45	49.7	26	70.5	8	46.4	31	52.0
18. Estimated percent of revenue for public elem/sec. schools from state government, 1971-72	69.4	3	43.3	23	25.1	42	48.7	17	40.9
19. Estimated percent of revenue for public elem/sec. schools from Federal government, 1971-72	7.1	29	7.1	29	4.3	46	4.9	41	7.1
I. School Expenditures									
20. Per capita state expenditures for all education, 1970	$ 259.28	4	$ 130.48	42	$ 98.39	47	$ 150.72	30	$152.47
21. Estimated current expenditures for public elem/sec. schools per pupil ADA, 1971-72	1,097	7	1,071	9	1,298	3	1,073	8	929
22. Percent increase in estimated expenditures per pupil ADA, 1961-62 to 1971-72	126.1	23	143.4	11	140.7	13	138.1	14	122.0
23. Current expenditure per pupil in ADM, 1971-72	1,023	6	982	9	1,160	2	1,007	8	867

Source: State of Delaware, Delaware's Rank in the Fifty States on Various Educational and Related Statistics (Dover Delaware: Planning, Research, and Evaluation Division, Department of Public Instruction, July 1972), 2-8.

3. Delaware ranks lowest among the four states in the percent of teachers paid $9,600 or more in 1971-72.
4. Delaware ranks below its neighboring states in percent increase in per capita personal income, personal income per pupil, per capita disposable personal income as a percent of total personal per capita income, and in percent in current expenditures per pupil.
5. In sum, Delaware's competitive position to attract and to retain classroom teachers is not strong.

Beginning Teachers' Salaries

Table 4 lists beginning teachers' salaries for the 1971-72 school year. The data indicate that the mean of district salaries for beginning teachers in Delaware (without experience) was $7,700. This figure exceeded the state basic salary by $928. Stated another way, the average local district contribution to teachers' salaries in Delaware is 12 percent.

Salaries in Industry and Education

Table 5 illustrates the average starting salaries of classroom teachers compared with those in private industry. Comparing the data in Tables 4 and 5, it appears that:

1. The average salary (for the fifty states) for beginning classroom teachers with a Bachelor's degree was $7,061 in 1972-72.
2. The average salary for beginning classroom teachers in Delaware was $7,700, a difference of about $639.
3. Salaries for male and female college graduates in industry with a Bachelor's degree were relatively higher than the figures listed above. The index shown in Table 5 indicates that salaries in industry are 12 to 50 percent higher than those paid beginning classroom teachers.

TABLE 3-4

BEGINNING TEACHERS' SALARIES IN DELAWARE
1971-72*

State Basic Salary	$ 6,772
Appoquinimink	7,564
Claymont	7,900
Conrad Area	7,648
Alexis I. Dupont	8,128
Alfred I. Dupont	7,700
Delaware	7,773
Mount Pleasant	7,900
Marshallton-McKean	7,773
Newark	7,873
New Castle	7,748
New Castle Voc.-Tech.	7,980
Stanton	7,872
Capital Area	7,623
Caesar Rodney	7,573
Sussex County Voc.-Tech.	7,535
Lake Forest	7,523
Milford	7,373
Smyrna	7,573
Cape Henlopen	7,723
Kent County Voc.-Tech.	7,873
Delmar	7,373
Indian River	7,473
Laurel	7,350
Seaford	7,533
Woodbridge	7,422
Wilmington	8,400
A. Mean Salary, including Wilmington	7,700
B. Mean Salary, excluding Wilmington	7,672
C. State Basic Salary	6,772
Difference A-B	900
Difference C-A	928

---

* Bachelor's Degree, no experience

TABLE 3-5

AVERAGE STARTING SALARIES OF CLASSROOM TEACHERS COMPARED WITH THOSE IN PRIVATE INDUSTRY, 1965-66 THROUGH 1971-72

Position or subject field	School Year							
	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
1	2	3	4	5	6	7	8	9
BEGINNING TEACHERS WITH BACHELOR'S DEGREE [a]	$4,925	$5,142	$5,519	$5,941	$6,383	$6,850	$7,061	. . .
MALE COLLEGE GRADUATES WITH BACHELOR'S DEGREE [b]								
Engineering	7,584	8,112	8,772	9,312	9,960	10,476	10,500	$10,608
Accounting	6,732	7,128	7,776	8,424	9,396	10,080	10,260	10,356
Sales-Marketing.	6,276	6,744	7,044	7,620	8,088	8,580	8,736	8,904
Business Administration	6,240	6,576	7,140	7,560	8,100	8,124	8,424	8,568
Liberal Arts	6,216	6,432	6,780	7,368	7,980	8,184	8,292	8,328
Production Management	6,816	7,176	7,584	7,980	8,736	9,048	9,792	9,828
Chemistry	7,032	7,500	8,064	8,520	9,276	9,708	9,720	9,840
Physics	7,164	7,740	8,448	8,916	9,348	10,080	9,636	9,900
Mathematics-Statistics	6,672	7,260	7,944	8,412	8,952	9,468	9,192	9,276
Economics-Finance.	6,600	6,732	7,416	7,800	8,304	8,880	9,216	9,240
Other Fields	6,360	7,044	7,644	7,656	8,796	9,264	8,580	8,664
Total--all fields (weighted average) .	6,792	7,248	7,836	8,395	8,985	9,361	9,534	9,682
WOMEN COLLEGE GRADUATES WITH BACHELOR'S DEGREE [c]								
Mathematics-Statistics	d	6,324	7,104	7,776	8,484	8,952	9,312	9,516
General Business	. . .	5,520	6,000	6,840	7,104	8,184	8,076	8,184
Chemistry	. . .	7,056	7,452	8,280	8,532	9,180	9,744	9,816
Accounting	. . .	6,768	6,984	7,716	8,304	8,952	9,516	10,224
Home Economics	. . .	5,664	6,276	6,660	7,056	7,380	7,932	. . .
Engineering-Technical Research	. . .	7,260	8,208	8,904	9,672	10,128	10,608	10,560
Economics-Finance	. . .	6,000	6,636	6,984	7,224	8,400	8,400	. . .

TABLE 3-5 (Continued)

INDEX RELATIONSHIP TO STARTING SALARIES FOR TEACHERS

	School Year							
Position or subject field 1	1965-66 2	1966-67 3	1967-68 4	1968-69 5	1969-70 6	1970-71 7	1971-72 8	1972-73 9
BEGINNING TEACHERS WITH BACHELOR'S DEGREE [a]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	. . .
MALE COLLEGE GRADUATES WITH BACHELOR'S DEGREE [b]								
Engineering	154.0	157.8	158.9	156.7	156.0	152.9	148.7	. . .
Accounting	136.7	138.6	140.9	141.8	147.2	147.2	145.3	. . .
Sales-Marketing.	127.4	131.2	127.6	128.3	126.7	125.3	123.7	. . .
Business Administration	126.7	127.9	129.4	127.3	126.9	118.6	119.3	. . .
Liberal Arts	126.2	125.1	122.8	124.0	125.0	119.5	117.4	. . .
Production Management	138.4	139.6	137.4	134.3	136.9	132.1	138.7	. . .
Chemistry	142.8	145.9	146.1	143.4	145.3	141.7	137.7	. . .
Physics	145.5	150.5	153.1	150.1	146.5	147.2	136.5	. . .
Mathematics-Statistics	135.5	141.2	143.9	141.6	140.2	138.2	130.2	. . .
Economics-Finance.	134.0	130.9	134.4	131.3	130.1	129.6	130.5	. . .
Other fields	129.1	137.0	138.5	128.9	137.8	135.2	121.5	. . .
Total--all fields (weighted average) .	137.9	141.0	142.0	141.3	140.8	136.7	135.0	. . .
WOMEN COLLEGE GRADUATES WITH BACHELOR'S DEGREE [c]								
Mathematics-Statistics	. . .	123.0	128.7	130.9	132.9	130.7	131.9	. . .
General Business	. . .	107.4	108.7	115.1	111.3	119.5	114.4	. . .
Chemistry	. . .	137.2	135.0	139.4	133.7	134.0	138.0	. . .
Accounting	. . .	131.6	126.5	129.9	130.1	130.7	134.8	. . .
Home Economics	. . .	110.2	113.7	112.1	110.5	107.7	112.3	. . .
Engineering-Technical Research	. . .	141.2	148.7	149.9	151.5	147.9	150.2	. . .
Economics-Finance	. . .	116.7	120.2	117.6	113.2	122.6	119.0	. . .

[a] For school systems enrolling 6,000 or more pupils.

[b] From annual reports of Frank S. Endicott, Director of Placement, Northwestern University. Salaries are based on offers made to graduates by approximately 200 companies located throughout the United States. 1971-72 salaries are based on offers made in November 1971 to men who will graduate in June 1972.

[c] Computed from data presented in the Endicott reports.

[d] Not computed.

Source: Financial Status of the Public Schools, Committee on Educational Finance, National Education Association (Washington, D. C.: NEA, 1972), 17.

Salaries in Large and Small School Districts

Table 6 lists beginning and average salaries paid in the ten largest and ten smallest school districts in Delaware. The data indicate:

1. A difference of $743 between the average salaries of the ten largest and ten smallest school districts.
2. A difference of $1,171 between the average starting salary of the ten largest and ten smallest school districts.
3. The state basic salary for beginning teachers has considerable impact on what beginning teachers actually receive in salary. For example: the state basic salary for beginning teachers was $6,773 in 1972-73; $6,773 in 1971-72; $6,450 in 1970-71; $6,000 in 1969-70. This is an increase of 12.9 percent over a four-year period. (Source: Delaware Department of Public Instruction).

Sources of Public School Funds

Table 7 contains data relating to the sources of salaries, by units of government, for Delaware public school professional personnel for 1970-71. These items are noteworthy:

1. Salary expenditures in 1970-71 for the 7,162 public school professional employees in Delaware amounted to almost 74 million. Of this amount, the state share amounted to 76.6 percent; the local share 19.9 percent; and the federal contribution 3.5 percent.
2. Approximately 94 percent of the cost of public school personnel salaries in Delaware is allocated to members of the instructional staff.
3. Local contributions to salaries of school personnel are greatest for administrative personnel; least for instructional personnel. At least 31 percent of the administrative salaries are paid from local sources, while the figure is about 18 percent for all classroom teachers, and generally below 20 percent for instructional specialists.

TABLE 3-6

TEN LARGEST AND TEN SMALLEST DELAWARE REGULAR ATTENDANCE UNITS FALL ENROLLMENT 1971 AND AVERAGE TEACHERS' SALARIES BEGINNING TEACHERS' SALARIES*

TEN LARGEST ATTENDANCE UNITS

Rank	Attendance Unit	Per Pupil Expenditures 1970-71	No. Pupils Grades K-12 Fall, 1971	Beginning Teachers' Salaries 1971-72*	Average Teacher Salary 1970-71
1	Newark	$ 837	15,788	$7,873	$ 9,752
2	Wilmington	1123	15,327	8,400	10,689
3	Alfred I. duPont	939	11,542	8,128	10,787
4	New Castle-Gunning Bedford	771	9,267	7,980	9,716
5	Caesar Rodney	704	8,154	7,573	8,685
6	Capital	782	7,032	7,623	9,144
7	Conrad	753	6,688	7,648	10,074
8	Indian River	729	6,431	7,648	8,780
9	Stanton	838	6,171	7,872	10,319
10	Mount Pleasant	866	5,838	7,900	10,725
	MEAN			8,738	9,867
	TEN SMALLEST ATTENDANCE UNITS				
1	Delmar	$ 848	672	$7,373	$ 8,845
2	Woodbridge	680	2,213	7,422	8,576
3	Laurel	828	2,231	7,350	8,649
4	Appoquinimink	917	2,384	7,564	8,884
5	Smyrna	758	3,019	7,573	8,935
6	Alexis I. duPont	1105	3,096	7,700	10,608
7	Lake Forest	778	3,462	7,523	8,868
8	Cape Henlopen	822	3,806	7,723	9,217
9	Claymont	773	3,912	7,900	9,885
10	Seaford	783	3,917	7,533	8,768
	MEAN			7,567	9,124

Source: State of Delaware, Analysis of September 30, 1971 Enrollment Statistics (Dover, Delaware: Planning, Research and Evaluation Division, The Department of Public Instruction Oct. 1971), 5.

* Bachelor's Degree, no experience

TABLE 3-7

SALARIES FROM STATE, LOCAL, AND FEDERAL FUNDS FOR DELAWARE PUBLIC SCHOOL PROFESSIONAL PERSONNEL, 1970-71

Position	Number	Total State	Percent of Grand Total	Total Local	Percent of Grand Total	Total Federal	Percent of Grand Total	Grand Total
Administration								
Superintendent	26	$ 453,145	67.9	$ 214,290	32.1	$ ---	---	$ 667,435
Assistant Superintendent	15	239,101	70.9	98,318	29.1	---	---	337,419
Director	44	598,212	66.5	240,349	26.7	60,782	6.8	899,343
Administrative Assistant	28	348,785	70.2	148,250	29.8	---	---	497,035
Other Administrative	53	216,222	32.2	251,659	37.5	203,883	30.3	671,764
TOTAL	166	1,855,465	60.4	952,866	31.0	264,665	9.6	3,072,996
Instruction-Classroom Teachers								
Elementary Teacher	2,796	21,021,800	78.7	4,760,753	17.8	942,753	3.5	26,725,306
Elementary Special Teacher	228	1,742,865	81.1	390,141	18.2	15,590	.7	2,148,596
Secondary Teacher	2,940	22,810,628	78.3	5,582,774	19.2	734,542	2.5	29,127,944
Secondary Special Teacher	70	525,930	77.8	134,364	19.9	15,817	2.3	676,111
TOTAL	6,034	46,101,223	78.6	10,868,032	18.5	708,702	2.9	58,677,957
Other Instructional								
Principal	240	2,930,867	71.8	1,044,601	25.6	107,279	2.6	4,082,747
Assistant Principal	38	401,249	71.7	132,881	23.8	25,425	4.5	559,555
Supervisor	77	740,302	63.6	368,095	31.6	56,096	4.8	1,164,493
Librarian	138	1,089,669	78.1	271,757	19.5	33,535	2.4	1,394,961
Guidance Counselor	163	1,444,664	72.8	430,609	21.7	109,986	5.5	1,985,259
Psychologist	34	316,491	70.3	121,761	27.1	11,568	2.6	449,820
Speech & Hearing	35	282,080	80.0	67,516	19.1	3,256	.9	352,852
Other Instructional	36	161,708	46.4	63,337	18.2	122,441	35.2	347,486
TOTAL	761	7,367,030	71.3	2,500,557	24.2	469,586	4.5	10,337,173
TOTAL INSTRUCTIONAL	6,795	53,468,253	77.5	13,368,589	19.4	2,178,288	3.1	69,015,130

TABLE 3-7 (Continued)

Position	Number	Total State	Percent of Grand Total	Total Local	Percent of Grand Total	Total Federal	Percent of Grand Total	Grand Total
Attendance and Social Work								
Social Worker	11	$ 50,655	41.6	$ 16,849	13.8	$ 54,283	44.6	$ 121,787
Visiting Teacher	20	149,642	77.9	33,510	17.5	8,885	4.6	192,037
TOTAL	31	200,297	63.8	50,359	16.1	63,168	20.1	313,824
Health Services								
School Nurse	165	1,027,651	75.3	267,603	19.6	69,235	5.1	1,364,489
Other Health Personnel	5	15,144	30.7	34,262	69.3	---	---	49,406
TOTAL	170	1,042,795	73.8	301,865	21.3	69,235	4.9	1,413,895
TOTAL	7,162	$ 56,566,810	76.6	$ 14,673,679	19.9	$ 2,575,356	3.5	$ 73,815,845

Source: State of Delaware, Report of Educational Statistics, 1970-71. (Dover, Delaware: The State Board of Education and The State Department of Public Instruction, 1971), 14.

SUPPLY OF AND DEMAND FOR DELAWARE PUBLIC SCHOOL PERSONNEL

The purpose of the text following is to provide a brief analysis of the supply of and demand for public school personnel in Delaware. More specifically, the analysis will focus upon: a) present personnel requirements; b) supply of personnel; c) turnover; d) sources of professional personnel; and e) certification trends.

Present Personnel Requirements

Table 8 contains data relating to the number of educational personnel in the Delaware public schools for the 1970-71 school year, as well as total and average salaries allocated to this sector of the budget. Highlights of the data contained in Table 8 are as follows:

1. In the school year 1970-71, the task of educating 131 thousand pupils required 7,162 professional personnel, a ratio of about 18.1 pupils per professional employee.
2. Of the 7,162 professionals, 6,795 or 95 percent were allocated to instruction; 2.4 percent to administration; 2.6 percent to attendance, social and health personnel.
3. Salaries of superintendents averaged $25,671; principals, $17,011. These figures indicate salaries paid to professional administrators in Delaware are competitive with administrative salaries in surrounding states.*

Supply of Personnel

Table 9 contains data relative to the supply of educational personnel in Delaware as of 1971-1972. Examination of the information contained in Table 9 indicates:

---

*For comparative data on administrative salaries see "The Cost of Education Index, School Management 16, No. 1 (January, 1972), 40; and Economic Aspects of Public Education in Pennsylvania, 1971-72, Philadelphia (Graduate School of Education), 1972.

TABLE 3-8

EDUCATIONAL PERSONNEL IN DELAWARE PUBLIC SCHOOLS
POSITION, NUMBER, SALARY
1970 - 1971

Professional Personnel	Number	Total Salary	Average Salary
Administration			
Superintendent	26	$ 667,435	$25,671
Assistant Superintendent	15	337,419	22,495
Director	44	899,343	20,440
Administrative Assistant	28	497,035	17,751
Other Administrative	53	671,764	12,675
Total	166	3,072,996	18,512
Instruction			
Classroom Teacher			
Elementary Teacher	2,796	26,725,306	9,558
Elementary Special Teacher	228	2,148,596	9,424
Secondary Teacher	2,940	29,127,944	9,907
Secondary Special Teacher	70	676,111	9,659
Total	6,034	58,677,957	9,725
Other Instructional			
Principal	240	4,082,747	17,011
Assistant Principal	38	559,555	14,725
Supervisor	77	1,164,493	15,123
Librarian	138	1,394,961	10,108
Guidance Counselor	163	1,985,259	12,180
Psychologist	34	449,820	13,230
Speech and Hearing Therapist	35	352,852	10,081
Other	36	347,486	9,652
Total	761	10,337,173	13,584
Total	6,795	69,015,130	10,157

TABLE 3-8 (Continued)

Professional Personnel	Number	Total Salary	Average Salary
Attendance and Social Work			
Social Worker	11	121,787	11,072
Visiting Teacher	20	192,037	9,602
Total	31	313,824	10,123
Health Services			
School Nurse	165	1,364,489	8,270
Other Health Personnel	5	49,406	9,881
Total	170	1,413,895	8,317
TOTAL PROFESSIONAL PERSONNEL	7,162	$73,815,845	$10,307

Revised on September 22, 1971 based on final computer printout.

Note: Grouping[illegible]e according to the personnel categories recommended by U.S.O.E.

Source: Planning, Research, and Evaluation Division, Delaware Department of Public Instruction, Dover, Delaware.

TABLE 3-9

SUPPLY OF EDUCATIONAL PERSONNEL IN DELAWARE 1971-1972

Category	Classroom Teachers		Other Instructional Employees	Non-Instructional Employees	Total Employees	Percent of Total
	Elem.	Sec.				
New Employees Not in Education Last Year						
Without Previous Ed. Exp.	125	139	7	5	276	3.8
Reentering	354	363	296	119	1,132	15.6
Experience Not Reported	41	58	1	12	112	1.5
Total New Employees	520	560	304	136	1,520	(20.9)
Old Employees-Employed in Education last year						
Outside Delaware	159	173	20	16	368	5.1
Changed Districts in Del.	65	88	13	2	168	2.3
Unchanged-same as last year	2,132	2,255	397	270	5,054	69.5
Location Not Reported	10	16	1	1	28	.4
Total Old Employees	2,366	2,532	431	289	5,618	(77.3)
Employment Not Reported Last Year	41	53	15	23	132	1.8
TOTAL ALL	2,927 (40.3%)	3,145 (43.2%)	750 (10.3%)	448 (6.2%)	7,270 (100.%)	100.%

1. Of the 7,270 educational personnel in Delaware in 1971-1972, a total of 1,520 or 20.9 percent of the professional staff were new employees.

2. Of the new employees, 3.8 percent to total personnel were without previous experience; 15.6 percent of total were re-entrants to teaching; 1.5 percent of total of the experience of new employees were not reported.

3. Five percent of the total personnel were employed outside of Delaware; 2.3 percent of the total personnel changed districts within the state.

Additional insight of the demand and supply picture for Delaware public school personnel may be gleaned from an examination of the data contained in Table 9.

The information in Table 10 is designed to bring into focus the relationship between the number of vacancies and the number of applicants by subject category between 1971-72 and 1972-73. The analysis shows:

1. For the state of Delaware, there were 534 position vacancies in June, 1962. For these positions there were 14,949 applicants. In effect, the applicants to vacancy ratio was estimated to be 28-1, which indicates that the personnel supply greatly exceeds demand.* However, the actual applicants to vacancy ratio is probably not nearly that high. In times when the supply of teachers exceeds vacancies, teachers frequently apply to several different boards of education. If the typical applicant applied to an average of four districts the applicant vacancy ratio would be 7-1 instead of 28-1. Unfortunately, data on duplicate applications are not available.

2. Subject or assignment areas where the supply is greatest include:

---

*The 28-1 ratio cited above is not a precise statistic, because: the number of applicants in some cases are estimated, the potential duplication of figures, the time (summer) the estimates were made, and the absence of several district reports.

TABLE 3-10

POSITION VACANCIES IN DELAWARE AND APPLICANTS
BY TEACHER ASSIGNMENT CATEGORY, 1971-72 to 1972-73

Assignment	Number of Vacancies June, 1972	Number of Applicants	Applicants to Vacancy Ratio
Elementary:			
Regular instruction	124	4,493	36 - 1
Special education	40	280	7 - 1
Librarians	11	100	9 - 1
Guidance counselors	7	81	12 - 1
Secondary:			
Agriculture	3	55	18 - 1
Art	10	345	35 - 1
Business education	11	308	28 - 1
Distributive education	5	69	14 - 1
English language arts	48	1,155	24 - 1
Foreign languages	11	528	48 - 1
Home economics	13	415	32 - 1
Industrial arts	19	157	8 - 1
Mathematics	34	555	16 - 1
Music	17	503	30 - 1
Physical and health education			
Men	12	557	46 - 1
Women	8	409	51 - 1
Natural and physical sciences	26	438	17 - 1
Social sciences	26	1,626	63 - 1
Trade, industrial, voc-tech.	23	97	4 - 1
Special education	25	209	8 - 1
Librarians	9	121	13 - 1
Guidance counselors	9	282	31 - 1

TABLE 3-10 (Continued)

Assignment	Number of Vacancies June, 1972	Number of Applicants	Applicants to Vacancy Ratio
Ungraded:			
School psychologists	8	73	9 - 1
School social workers	2	74	37 - 1
School nurses	5	100	20 - 1
Special Assignments:			
Educationally disadvantaged	2	13	7 - 1
Remedial reading, speech, correction, etc.	10	106	11 - 1
Vacancies and applicants not reported by category*	16	1,800	
STATE TOTALS	534	14,949	28 - 1

Note: New Castle-G. Bedford number of vacancies and applicants were not included in above table since applicants were not reported.

*All vacancies and applicants listed for this category are from Mt. Pleasant School District. District did not have listing of applicants broken down by subject matter area.

Source: State Department of Public Instruction, Dover, Delaware.

Area	Ratio
Social Sciences	63-1
Physical Education	51-1 (Women) 46-1 (Men)
Foreign Languages	48-1
Social Workers	37-1
Home Economics	32-1

3. The supply is more limited in the following areas:

Area	Ratio
Librarians	9-1 (Elementary)
Special Education	7-1 (Elementary) 8-1 (Secondary)
Educationally Disadvantaged	7-1
Trade, Industrial, Vocational-Technical	4-1
Industrial Arts	8-1

4. The greatest number of applicants for all categories was regular elementary instruction. A total of 4,493 applicants sought 124 vacancies.

Sources of Delaware Personnel

Table 11 has been included to shed light on the sources from which Delaware public school personnel are recruited. The information indicates:

1. Of the 7,162 total professional personnel in Delaware in 1970-71, 30.7 percent received their Bachelor's degree in Pennsylvania. Twenty-three point six percent of the degree holders come from Delaware.

2. In short, 76.4 percent of the educational personnel in the Delaware public schools in 1970-71 were prepared in institutions outside of Delaware.

3. When the figures in Table 11 are examined in terms of position categories, it is clear that other states provided, percentage-wise, more personnel than Delaware for all classes of positions.

Examination of Table 12 provides a glimpse of the trend of occupational status of Delaware graduates in education, and lends support

TABLE 3-11

STATE WHERE BACHELOR DEGREE RECEIVED FOR PROFESSIONAL PERSONNEL
1970-71

Position	Delaware	Penn-sylvania	Maryland	West Virginia	New Jersey	Virginia	Other States	Not Reported*	Total
Administration									
Superintendent	3	11	1	2	-	-	9	-	26
Assistant Superintendent	2	8	1	1	-	-	3	-	15
Director	6	17	1	3	4	-	13	-	44
Administrative Assistant	3	17	1	1	2	1	3	-	28
Other	10	17	1	4	-	-	11	10	53
Total	24	70	5	11	6	1	39	10	166
Percentage	(14.5)	(42.2)	(3.0)	(6.6)	(3.6)	(.6)	(23.5)	(6.0)	(100)
Instruction									
Classroom Teachers									
Elementary Teacher . .	918	697	163	127	57	84	670	80	2,796
Elementary Special Tchr.	58	57	11	6	5	8	60	23	228
Secondary Teacher . . .	554	1,064	161	194	53	114	699	101	2,940
Secondary Special Tchr.	14	13	9	5	-	6	19	4	70
Total	1,544	1,831	344	332	115	212	1,448	208	6,034
Percentage	(25.6)	(30.3)	(5.7)	(5.5)	(1.9)	(3.9)	(24.0)	(3.4)	(100)
Other Instructional									
Principal	34	100	24	18	8	8	45	3	240
Assistant Principal . .	8	15	1	3	2	1	8	-	38
Supervisor	13	30	2	4	2	2	22	2	77
Librarian	16	39	6	13	1	10	50	3	138
Guidance Counselor . . .	26	55	10	9	3	9	51	-	163
Psychologist	2	15	2	1	-	1	13	-	34
Speech & Hearing Therapist	2	8	2	4	1	1	17	-	35
Other	6	7	-	-	-	5	4	14	36
Total	107	269	47	52	17	37	210	22	761
Percentage	(14.1)	(35.3)	(6.2)	(6.8)	(2.2)	(4.9)	(27.6)	(2.9)	(100)
Total	1,651	2,100	391	384	132	249	1,658	230	6,795
Percentage	(24.3)	(30.9)	(5.8)	(5.7)	(1.9)	(3.7)	(24.4)	(3.4)	(100)

TABLE 3-11 (Continued)

Position	Delaware	Penn-sylvania	Maryland	West Virginia	New Jersey	Virginia	Other States	Not Reported *	Total
Attendance and Social Work									
Social Worker	2	1	3	-	-	1	3	1	11
Visiting Teacher . . .	6	6	2	-	-	1	5	-	20
Total	8	7	5	-	-	2	8	1	31
Percentage	(25.8)	(22.6)	(16.1)	-	-	(6.5)	(25.8)	(3.2)	(100)
Health Services									
School Nurse	7	22	1	1	2	-	7	125	165
Other Health Personnel.	1	-	-	-	-	-	2	2	5
Total	8	22	1	1	2	-	9	127	170
Percentage	(4.7)	(12.9)	(.6)	(.6)	(1.2)	-	(5.3)	(74.7)	(100)
TOTAL PROFESSIONAL PERSONNEL	1,691	2,199	402	396	140	252	1,714	368	7,162
TOTAL PERCENTAGE	(23.6)	(30.7)	(5.6)	(5.5)	(2.0)	(3.5)	(23.9)	(5.1)	(100)

---

[*] Or no degree.

Source: Planning, Research, and Evaluation Division, State Department of Public Instruction, Dover, Delaware.

TABLE 3-12

OCCUPATIONAL STATUS OF DELAWARE GRADUATES IN EDUCATION 1966-1971

Graduates Occupational Status	9/1/65- 8/31/66 11/1/66		9/1/66- 8/31/67 11/1/67		9/1/67- 8/31/68 11/1/68		9/1/68- 8/31/69 11/1/69		9/1/69- 8/31/70 11/1/70	
	No.	%	No.	%	No.	%	No.	%	No.	%
ALL EDUCATIONAL										
Graduates	296	100	359	100	360	100	347	100	500	100
Teaching	181	61	240	67	236	66	203	59	267	53
Not Teaching	115	39	119	33	124	34	144	41	233	47
Graduates Teaching	181	100	240	100	236	100	203	100	267	100
In Delaware	104	57	138	58	159	67	145	71	174	65
Outside Delaware	77	43	102	42	77	33	58	29	93	35
Graduates Teaching Outside Delaware	77	100	102	100	77	100	58	100	93	100
New Jersey	-	-	-	-	18	23	17	29	28	30
Pennsylvania	-	-	-	-	18	23	14	24	21	23
Maryland	-	-	-	-	11	14	11	19	22	24
New York	-	-	-	-	3	4	4	7	4	4
Virginia	-	-	-	-	3	4	3	5	2	2
Other	-	-	-	-	24	32	9	16	16	17

Source: Planning, Research, and Evaluation Division, State Department of Education, Dover, Delaware.

to the conclusions previously drawn on the sources of personnel for the Delaware public schools. For example:

1. While the number of Delaware graduates in education increased from 296 to 500 from 1966-71, the percentage of graduates not teaching has risen from 39 to 49 percent over the same period.
2. In 1970 the state of Delaware graduated 500 Bachelor candidates in education; the number of vacancies reported in public education in June, 1972 was 534.
3. The retention of Delaware graduates in Delaware (all positions) is increasing--from 57 percent in 1966 to 65 percent in 1970.
4. It is apparent that New Jersey is claiming the highest number of educational personnel trained in Delaware, and the percentage has increased over a three-year period.

Table 13 contains data focused upon trends in the retention of education graduates from Delaware University and Delaware State College. The data indicate:

1. The number of graduates (elementary and secondary education) from the University of Delaware and Delaware State College has increased from 360 in 1967-68 to 500 in 1970-71, an increase of 39 percent. The percent of graduates teaching in Delaware has decreased over the same span--from 44 percent in 1968-69 to 35 percent in 1970-71.
2. Rentention in elementary classroom teachers appears to be generally higher than at the secondary level, even though there is a general retention decrease in both areas over that time period under consideration.

Certification Trends

Exhibit 3 shows the number of certificates issued to professional education personnel over the period 1963-64 to 1970-71. Analysis of the data in Exhibit 3 provide the following relevant observations:

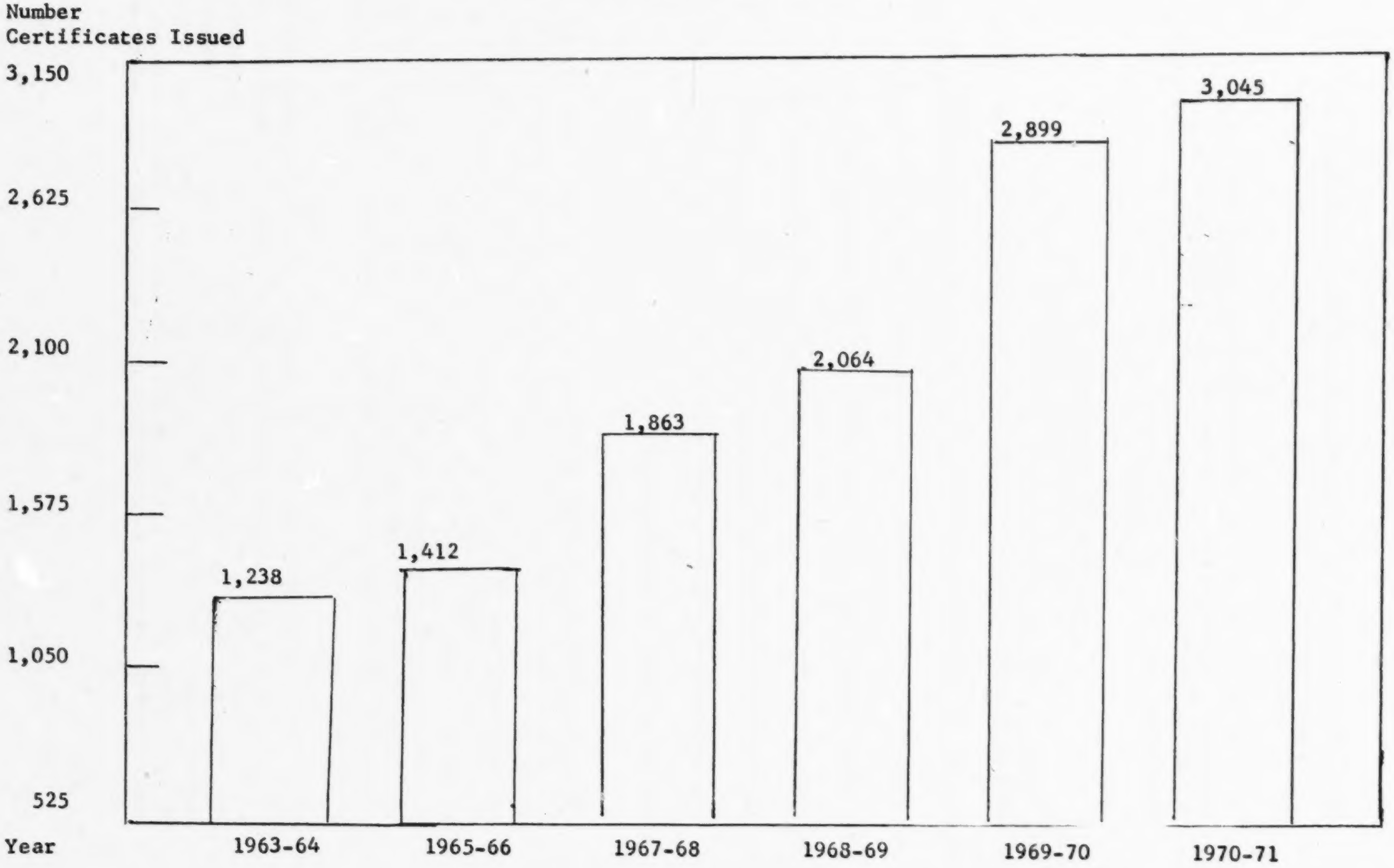
TABLE 3-13

GRADUATES FROM THE UNIVERSITY OF DELAWARE AND DELAWARE STATE COLLEGE SHOWING THE NUMBER BY SUBJECT AREA TRAINED IN DELAWARE AND TEACHING IN DELAWARE

	Delaware Graduates Teaching in Delaware								
Subject Areas	1967-1968 Graduates Total Number	1968-1969 Teaching In Del. No.	%	1968-1969 Graduates Total Number	1969-1970 Teaching In Del. No.	%	1969-1970 Graduates Total Number	1970-1971 Teaching In Del. No.	%
ELEMENTARY									
Regular Classroom	163	93	57	153	68	44	165	80	48
Special	-	-	-	5	1	20	17	3	18
Total Elementary	163	93	57	158	69	44	182	83	46
SECONDARY									
Agriculture	4	2	50	2	1	50	4	1	25
Art	6	5	83	12	10	83	18	6	33
Biology	5	-	-	8	5	62	-	-	-
Business Education	17	4	24	19	6	32	20	6	30
Chemistry	2	1	50	1	-	-	-	-	-
English	22	8	36	26	12	46	43	16	37
Foreign Languages	19	4	21	17	6	35	26	5	19
General Science	3	-	-	1	-	-	11	4	36
Guidance Counselor	-	-	-	-	-	-	21	5	24
Home Economics	33	9	27	20	7	35	32	10	31
Mathematics	9	5	56	16	8	50	20	11	55
Music	11	4	36	5	2	40	10	1	10
Physical & Health Education									
Men	12	3	25	16	6	37	35	6	17
Women	19	8	42	16	6	37	13	2	15
Social Studies	34	12	35	28	7	25	53	14	26
Speech	1	1	100	2	-	-	-	-	-
Other Secondary Subjects .	-	-	-	-	-	-	12	4	33
Total Secondary	197	66	34	189	76	40	318	91	29
TOTAL ELEMENTARY AND SECONDARY	360	159	44	347	145	42	500	174	35

Source: Planning, Research, and Evaluation Division, State Department of Public Instruction, Dover, Delaware.

EXHIBIT 3-3. NEW PROFESSIONAL EDUCATION CERTIFICATES ISSUED IN DELAWARE, 1963-64 - 1970-71



Source: State of Delaware, Report of Educational Statistics 1970-71 (Dover, Delaware: The State Board of Education and The State Department of Public Instruction, 1971), 5.

1. The number of education certificates issued in Delaware has increased from 1,238 in 1963-64 to 3,045 in 1970-71, a gain of 146 percent.

2. In 1970-71, there were 7,162 positions in public education in Delaware. Certificates to occupy these positions were granted to 3,045 applicants, a ratio of one applicant for every 2.3 positions available.

SUMMARY OF FINDINGS

The preceding discussion has focused upon the present status of public school personnel in terms of economic conditions, staffing provisions, and supply and demand for manpower. It can be generally concluded from this review that while provisions for public education in Delaware have not reached a state of perfection, progress has been and is continuing to be made relative to providing and retaining manpower for Delaware public schools. The following findings summarize both the progress in personnel as well as areas in need of modification.

1. While considerable progress has been made in Delaware with regard to the average salaries of instructional staff over a ten-year period (1961-62 to 1971-72), Delaware is not holding its relative salary ranking among the fifty states. In 1961-62, the average salary for instructional staff members in Delaware was $6,303 which ranked 7th among the states. In 1961-72, the average instructional salary for Delaware was $10,664, which ranked 14th among the states. Despite a 69.2 percent gain in average instructional salaries in Delaware over the period under consideration, Delaware's relative salary position is declining.

2. The relatively moderate decline of Delaware's position among the fifty states over the past decade affecting public education develops into a consistent pattern when examined in terms of a variety of variables. The state has dropped from first to third in the percent of public school revenue derived from the state government: from first to tenth in per capita personal income; risen from 48th to 45th in rank in public school revenues derived from local government; dropped from

first to fourth in per capita state expenditures for all education. While it may be said that the foregoing state of public education in Delaware is not alarming, it would be unfortunate if this regression in fiscal trends for public education continued over the decade of the seventies. Such a condition would place Delaware in a relatively weak position to compete for competent personnel needed for its schools.

3. For 1972-73 the average starting salary for teachers in Delaware without experience and a Bachelor's degree was $7,700. The average starting salary of classroom teachers for the nation as a whole in 1971-72 was $7,061. Data shown in Table 5 indicate that these salaries are not competitive with those in private industry. The implication of this analysis is that present starting teachers' salaries in Delaware and elsewhere are less than satisfactory from a competitive manpower standpoint.

4. As in most other areas of the United States, the supply of teachers has now caught up with, and gives every indication of exceeding by a considerable margin, the demand for educational personnel in Delaware. Some subject areas are in short supply; in others there is an unprecedented oversupply. This emerging imbalance between supply of and demand for educational personnel should enable districts to do what they have been seeking to do since the end of World War II--enable them to be highly selective in the employment of personnel.

SECTION 4

FINANCING SCHOOL CONSTRUCTION IN DELAWARE

W. Monfort Barr, Indiana University and
William R. Wilkerson, Indiana University

Delaware has a long and distinguished history of state concern for the school facilities needs of local school districts. Adoption of a program of state grants for capital outlay occurred in 1919, following the P. S. duPont study of school building needs in the state. Delaware was the first state to adopt and fund a significant program of state and local participation in school building finance. State support of local school construction averaged 60 pecent during the years 1919 through 1940; gifts accounted for another 20 percent.[1]

The state program has varied over the years, ranging from state assumption of building costs in excess of two percent of assessed valuation, partial state assumption of local debt service, to state grants of 60 percent of approved project cost of school construction in 1968-69.[2]

Among the innovations which should be credited to Delaware in the development of the theory of state and local participation in the financing of public school facility financing are:

1. Required state approval of projects.
2. Use of state bonds as a source of funds.
3. Eligibility of all districts
4. Inclusion of vocational schools and other special facilities.

5. Studies by the State Department of Public Instruction.
6. Development of objective formulas for determining state and local shares of project costs.
7. Continuity for more than 50 years of stable and significant policies for a program of state grants for facility funding.[3]

THE EXISTING PROGRAM

The state currently assumes 60 percent of the approved project costs of most public elementary and secondary school construction. Vocational education buildings and all special education facilities (except those for the educable mentally handicapped) are paid for entirely from state funds. Classrooms for EMR pupils are included in the regular program. The existing Delaware program for financing school construction is generally regarded as among the best in the United States, since such a heavy infusion of state funds does much to solve the problem of extreme variations in local district fiscal capacity.

The state educational agency of Delaware is staffed with school planning experts and provides local districts with more services than is the case in most states. Competent assistance with determination of needs, preparation of educational specifications, and evaluation of drawings and specifications is available, upon request, to local school districts.

The Delaware program for financing school facilities is exemplary in many ways, but it is not wholly without problems. Some of the key features become apparent in the following description of the progression of a project from the need stage to construction. While there may be variations in the procedure, the step-by-step process described below is typical.

After the need for a project is recognized by the local school district, it is included in a six-year Major Capital Improvement request which is submitted to the Department of Public Instruction. Evaluation of the proposal is made by the school planning staff of the DPI, and it is then transmitted to the State Board of Education for approval which takes the form of a Certificate of Necessity.

At this point, the Certificate of Necessity and the six-year Major Capital Improvement request is submitted to the Office of State Planning which reviews and submits to the office of the Governor. Advance planning money (10 percent of the architect's fee) can then be obtained for the purpose of preparing educational specifications and hiring the architect to begin schematics. Educational specifications must be approved by the Department of Public Instruction.

The local district then holds a referendum to obtain voter approval of the proposed project and to authorize issuance of local district building bonds. The amount of the local share of the project is 40 percent of approved project cost, and any construction in excess of the formula allowance must be funded from local sources. The funding formula currently provides $46 multiplied by allowable square footage derived from the capacity and nature of the proposed facility.

After the referendum has received a favorable vote, schematics are prepared and submitted to the DPI for approval. Design money (75 percent of the architect's fee) is applied for in the next Major Capital Improvement Program to be funded by the legislature. Completed schematics, preliminary drawings and specifications are then prepared and approved by the DPI and other pertinent state agencies.

At the next session of the General Assembly, the Capital Improvement Act will include the total cost of the project and will authorize the issuance of state bonds to raise funds for the state share and for state purchase, at private sale, of local district bonds. Bids for construction can now be advertised and contracts awarded. Construction then begins.

The length of time from determination of need to occupancy can vary considerably, but in any case, about two years elapses from issuance of the Certificate of Necessity by the State Board of Education to the awarding of construction contracts.

There is also a provision in the Delaware procedures to permit site acquisition well in advance of the date needed for construction. Approvals of the proposed site are secured from the various state agencies, and funds are obtained by the DPI from the Office of State Planning. The site is purchased and held by the school district and the purchase price is ultimately repaid from construction funds to the Advance Land Acquisition Fund.

The allowable project cost of $46 per square foot includes site, construction, and equipment costs and all fees. Up to one percent of the allowance must be used for on-site project supervision and inspection and an additional one-half percent is authorized for the audit function.

The local share of project costs, as mentioned previously, is obtained by issuance of local district bonds which are sold to the state of Delaware at a private sale. The provision for state purchase of local bonds is new, and was brought about by recognition of the fact that local districts were not treated uniformly by the bond market and that substitution of state credit for local credit could effect savings. Interest rates charged to local districts are not less than the interest rate paid by the state, on its Moody Aa rated bonds, plus up to 1/4 of one percent per annum to cover administrative expenses incurred.

The Wilmington School District is fiscally dependent upon the civil government of the city of Wilmington. Consequently, certain exceptions may be noted for the district, particularly with regard to raising of the local funds, bond sales, and like matters.

Local districts can also use funds obtained from gifts, insurance settlements, other monies not legally required for other purposes, and federal sources for the local share of project costs. Delaware law makes no provision for local district establishment of reserve funds for school building purposes. Debt service funds are obtained from per capita and ad valorem levies.

EFFECTS OF RECENT SCHOOL CONSTRUCTION PROGRAMS IN DELAWARE

From 1950 to July, 1964 a total of $177,316,718 was spent for school construction in Delaware.[4] The following table shows expenditures from July, 1964 through June 30, 1971.

The total expended in the 21-year period was $431,719,629 which indicates that substantial effort for school construction has been exerted at both the state and local school district level.

TABLE 4-1

EXPENDITURES FOR SCHOOL BUILDINGS, SITE, AND EQUIPMENT FOR DELAWARE PUBLIC SCHOOLS

Date	Amount
1964-65	$ 29,873,437
1965-66	35,813,779
1966-67	30,807,605
1967-68	26,888,589
1968-69	32,236,087
1969-70	44,286,247
1970-71	54,497,167

Source: Statistical Reports of State Department of Public Instruction.

Table 2 shows state and local share authorizations for school construction for fiscal 1967 through fiscal 1972. Since the time lag from authorization to expenditure may vary from project to project, it is impossible to tie a given year's expenditure total back to a specific year's authorization. However, it is apparent that the 1971 and 1972 fiscal year authorizations will enable another $54 million to be expended for school buildings in Delaware in the very near future. The Capital Improvement Act for fiscal 1973 adds authorization for another $22,700,000.

The need for school buildings has been imperative, throughout the United States, since World War II. The virtual moratorium on school construction during the Depression years and World War II, the post-war

TABLE 4-2

SCHOOL BUILDING PROJECT AUTHORIZATION, FISCAL 1967 THROUGH FISCAL 1972

Fiscal Year	State	Local	Total
1967	$ 18,304,592	$ 9,450,248	$ 27,754,840
1968	10,643,200	6,772,800	17,416,000
1969	15,679,000	10,816,000	26,495,000
1970	14,219,000	3,587,000	17,806,000
1971	21,526,000	12,987,000	34,513,000
1972	13,039,000	6,548,000	19,587,000

Source: Capital Improvement Acts and Reports from Delaware Department of Public Instruction.

baby boom, the emergence of new educational philosophies and techniques, school district reorganization, and racial integration have been forces contributing to the necessity for school building projects.

By 1971-72, less than 25 percent of Delaware pupils were housed in buildings occupied prior to 1950, as is shown in Table 3. Districts with a much greater proportion of their pupils housed in pre-1950 buildings were Appoquinimink, Conrad Area, Wilmington, Lake Forest, Smyrna, Cape Henlopen, Indian River, Laurel, and Woodbridge. On the other hand, Alfred I. duPont, De La Warr, Marshallton-McKean, Newark, and Stanton had fewer than 10 percent of their pupils in pre-1950 buildings. It should be pointed out that many older buildings are still quite usable for today's educational programs, and the purpose of Table 3 is not to point out further need but rather to indicate what had been accomplished by the expenditure of $431.7 million for school construction since 1950.

TABLE 4-3

NUMBER AND PERCENT OF DELAWARE PUPILS, BY DISTRICT,
GROUPED ACCORDING TO AGES OF BUILDINGS IN WHICH HOUSED

School	Housed in buildings occupied before 1950		Housed in buildings constructed after 1950		Total
	No. of pupils	Percent	No. of pupils	Percent	
Alexis I. duPont	731	25.5	2,134	74.5	2,865
Alfred I. duPont	472	4.4	10,163	95.6	10,635
Appoquinimink	982	42.5	1,329	57.5	2,311
Claymont	616	16.6	3,087	83.4	3,703
Conrad Area	2,264	34.3	4,335	65.7	6,599
De La Warr	234	5.6	3,955	94.4	4,189
Marshallton - McKean	296	6.5	4,228	93.5	4,524
Mount Pleasant	1,707	29.1	4,155	70.9	5,862
New Castle - G. Bedford	1,338	16.1	7,070	83.9	8,308
Newark	930	6.2	14,031	93.8	14,961
Stanton	225	3.9	5,536	96.1	5,761
Wilmington	8,540	58.9	5,949	41.1	14,489
Caesar Rodney	622	10.6	5,249	89.4	5,871
Capital	1,053	15.5	5,761	84.5	6,814
Lake Forest	1,107	35.0	2,054	65.0	3,161
Milford	1,141	28.2	2,904	31.8	4,045
Smyrna	1,217	43.8	1,563	56.2	2,780
Cape Henelopen	1,511	41.3	2,146	58.7	3,657
Delmar	N/A		N/A		
Indian River	2,907	47.8	3,172	52.2	6,079
Laurel	757	34.9	1,411	65.1	2,168
Seaford	865	23.2	2,856	76.8	3,721
Woodbridge	1,154	54.9	947	45.1	2,101
TOTALS	30,669	24.6	94,035	75.4	124,704

Source: Surveys of School Buildings for Determination of Maintenance Allotment, State Department of Public Instruction, Dover.

State Debt

Total outstanding debt of the state of Delaware for the state share of school construction was $115,805,000 as of June 30, 1971.[5] The state issues are usually for 20 years, and some principal is retired annually. Final payments on those issues outstanding in 1969 will occur by 1991 with final payments on existing issues for selected years as follows:[6]

Year	Amount of final payments	Cumulative total of final payments
1971	$ 500,000	$ 500,000
1976	343,000	1,664,000
1981	776,000	4,663,000
1986	398,000	7,440,000
1991	726,000	10,870,000

The Governor's Action Force report contained the recommendation that amounts equivalent to the "released funds" represented by final payments be used for cash payments toward school construction projects to move the state toward using a mixture of current and borrowed funds for school construction.

State Debt Service

Principal and interest costs, on the state bonds issued for school construction, ranged from slightly under $10 million in 1966-67 to more than $14 million in 1970-71. Table 4 shows annual payments for a five-year period.

TABLE 4-4

STATE OF DELAWARE SCHOOL BOND PRINCIPAL AND INTEREST PAYMENTS

Year	Bond Principal	Bond Interest	Total
1966-67	$ 7,154,159	$ 2,812,037	$ 9,966,196
1967-68	8,007,130	3,222,648	11,229,778
1968-69	8,622,015	3,641,851	12,263,866
1969-70	9,594,975	4,220,802	13,815,777
1970-71	9,778,837	4,403,201	14,182,038

Source: Statistical Reports of Department of Public Instruction.

Projections of principal and interest payments on state bonds for school construction were developed for the Governor's Economy Task Force.[7] These estimates were based upon straight line projections of the 1966-67 through 1969-70 experience; annual estimated requirements were:

1971 - $15,577,288

1972 - $17,563,660

1973 - $19,802,723

1974 - $22,327,569

1975 - $25,174,333

1976 - $28,384,059

Local Debt

It was mentioned previously that the state share of approved project costs is 60 percent and that the state pays all of the costs of special education facilities (except classrooms for the educable mentally retarded) and of vocational-technical schools. The local districts' 40 percent share of approved project costs and any extra costs are ordinarily financed by the proceeds of local bond issues, which are now sold to the state at private sale.

Table 5 shows the total of local bonded debt for school building purposes and per pupil debt. Local debt had increased by about $30 million in the 10-year period, and debt per pupil had increased by only $50 due to the rapid increase in school enrollments during the decade.

TABLE 4-5

TOTAL AND PER PUPIL BONDED DEBT OF ALL DELAWARE SCHOOL DISTRICTS

Date	Total Bonded Debt	Debt Per Pupil in ADM
1961-62	$ 44,097,510	$ 514
1962-63	45,031,760	497
1963-64	49,703,860	516
1964-65	59,401,410	583
1965-66	55,555,780	526
1966-67	64,190,030	585
1967-68	67,180,721	587
1968-69	70,375,230	571
1969-70	70,256,858	543
1970-71	74,127,474	564

Source: Annual Reports of Statistical Information, State Department of Public Instruction.

Since districts can bond to 10 percent of assessed valuation, approximately $109 million in local bonded debt leeway existed in 1970-71. Table 6 shows the calculation of debt potential, debt outstanding, and total and per pupil debt leeway for each Delaware school district. The heavy infusion of state funds in the past has kept local districts in an enviable position compared to districts in most other states. There is, however, great variation among districts with respect to ability to fund future construction.

Per pupil bond leeway averaged $843 in 1970-71. At the usual ratio of 40 percent local funding of school construction, then an average of about $2,100 per pupil could be raised for school building purposes. Again, variations among districts need to be examined. The range in per pupil bonded debt leeway was from $101 in Newark to $1,735 in Alexis I. duPont.

Local Debt Service

Table 7 shows local district debt service payments of local school districts for 1963-64 through 1970-71.

Debt service payments nearly doubled in the period covered by Table 7. On a per pupil basis, debt service payments increased about 50 percent.

Calculations were made of the average debt service tax rate for all school districts based upon statewide totals for assessed valuation. The average rate for recent years was:

1966-67 - $0.347
1967-68 - $0.381
1968-69 - $0.437
1969-70 - $0.425
1970-71 - $0.459

TABLE 4-6

ASSESSED VALUATION, BONDED DEBT POTENTIAL, BONDED DEBT OUTSTANDING, AND DEBT LEEWAY OF DELAWARE SCHOOL DISTRICTS, 1970-71

District	Assessed Valuation	Bonded Debt Potential	Bonded Debt Outstanding	Debt Leeway	
				Total	Per Pupil*
Alexis I. duPont	$ 106,845,000	$ 10,684,500	$ 5,593,250	$ 5,091,250	$ 1,735
Alfred I. duPont	177,422,600	17,742,260	9,390,000	8,352,260	783
Appoquinimink	24,600,000	2,460,000	425,400	2,034,600	852
Claymont	53,226,000	5,322,600	2,518,000	2,804,600	725
Conrad Area	92,643,000	9,264,300	2,234,000	7,030,300	1,024
De La Warr	39,549,700	3,954,970	1,606,340	2,348,630	545
Marshallton-McKean	62,689,800	6,268,980	1,865,000	4,403,980	938
Mount Pleasant	111,190,000	11,119,000	2,029,000	9,090,000	1,496
New Castle-G. Bedford	119,554,500	11,955,450	5,168,400	6,787,050	803
Newark	186,831,400	18,683,140	17,104,000	1,578,740	101
Stanton	69,061,150	6,906,115	5,089,029	1,817,086	295
Wilmington	301,296,130	30,129,613	6,554,623	23,574,990	1,553
Caesar Rodney	56,489,440	5,648,944	3,173,000	2,475,944	409
Capitol	104,047,200	10,404,720	2,676,320	7,728,400	1,100
Lake Forest	31,694,000	3,169,400	988,120	2,181,280	666
Milford	39,135,230	3,913,523	2,085,104	1,828,419	440
Smyrna	34,262,000	3,426,200	1,894,000	1,532,200	551
Cape Henlopen	63,151,397	6,315,139	568,000	5,747,139	1,506
Delmar	7,677,575	767,757	180,788	586,969	885
Indian River	78,353,363	7,835,336	971,500	6,683,836	1,091
Laurel	18,190,111	1,819,011	181,700	1,637,311	755
Seaford	37,884,111	3,788,411	1,509,500	2,278,911	1,051
Woodbridge	17,299,508	1,729,950	322,000	1,407,950	649
TOTALS	$1,833,093,615	$183,309,361	$74,127,474	$109,181,887	$ 843

*Based upon Fall, 1970 enrollment, grades K-12.

Source: *Report of Educational Statistics, 1970-71*, State Board of Education and Department of Public Instruction, State of Delaware, pp. 46-49.

TABLE 4-7

DEBT SERVICE PAYMENTS OF DELAWARE SCHOOL DISTRICTS, 1963-64 THROUGH 1970-71

Year	Bond Principal	Bond Interest	Total	Debt Service Per Pupil in ADM
1963-64	$ 2,888,546	$ 1,435,168	$ 4,323,714	$ 44.90
1964-65	N/A	N/A	4,825,786	47.37
1965-66	3,557,630	1,779,599	5,337,229	50.43
1966-67	3,686,550	1,718,316	5,404,866	49.33
1967-68	4,060,850	2,123,385	6,184,235	54.00
1968-69	5,143,601	2,188,662	7,332,263	61.91
1969-70	4,912,174	2,531,016	7,443,190	61.35
1970-71	5,830,710	2,574,926	8,405,636	67.94

Source: Annual Reports, Department of Public Instruction.

Debt service payments, for all districts, have been increasing relatively faster than has assessed valuation, as is demonstrated by the average rate change from $0.347 to $0.459.

Construction Costs

Construction cost trends for Delaware are largely determined by the allocation per square foot incorporated in the school construction cost formula. Allocations for recent years were as follows:

1967-68 - $30.00
1968-69 - 30.00
1969-70 - 34.00
1970-71 - 40.00
1971-72 - 46.00
1972-73 - 46.00

These allowances are to cover all project costs, including site, site development, all fees, and fixed and movable equipment as well as the more direct costs of construction. Delaware lies in the highest labor cost region of the nation, and the fact that school construction costs are so much influenced by wage rates paid to craftsmen means that the historical trend portrayed above will continue unless different delivery systems can be devised for the school building process.

There appear to be some problems associated with application of the Delaware formula, and these will be discussed later in this report. However, it should be pointed out that the square footage allowances for building projects are not unduly generous when compared to other states and some cost control is thus achieved on new projects.

FISCAL CONSEQUENCES ON LOCAL DISTRICTS

A previous section of the report (Table 6 and its discussion) dealt with bonded debt potential and leeway for individual districts. It was noted that average bonded debt leeway was $843 per pupil, with a range from $101 for Newark to $1,735 for Alexis I. duPont. The amount of debt leeway is a function of at least two variables - previous school building effort and assessed valuation.

Table 8 shows enrollment, bonded debt and relative bonded debt per pupil, debt leeway and relative debt leeway per pupil, along with relative full valuation per pupil. Analysis of this table gives indication of the interwoven effect of previous effort and assessed valuation. For example, the Alexis I. duPont District, with $1,906 bonded debt per pupil had 333 percent of the statewide average debt per pupil of $573. Yet its debt leeway per pupil of $1,735 was 206 percent of the statewide average of $873. This relationship of out-standing debt and debt leeway was affected significantly by the fact that the district's fiscal ability, in terms of full valuation per pupil, was 241 percent of the average district in the state.

Put more simply, the fact that the Alexis I. duPont District was wealthy enabled it to incur substantially more debt per pupil and yet leave it in position to incur much more debt than could the average district.

The Newark District finds itself in different circumstances. It had relative per pupil debt of 192 percent of the state average, but only 12 percent of the average debt leeway. Newark's relative full valuation per pupil was 79 percent of the state average, and the combination of relatively low wealth and heavy previous bond effort will severely hamper it if much new school building debt is necessary.

Another situation is illustrated by the De La Warr district. Relative bonded debt is 65 percent of the state average, debt leeway is also 65 percent of the state average, and relative full valuation per pupil is 61 percent.

TABLE 4-8

ENROLLMENT, BONDED DEBT, DEBT LEEWAY, AND RELATIVE FULL VALUATION PER PUPIL IN DELAWARE, 1970-71

District	Number of Pupils Enrolled, Fall, 1970	Bonded Debt Per Pupil	Relative Bonded Debt Per Pupil	Debt Leeway Per Pupil	Relative Debt Leeway Per Pupil	Relative full Valuation Per Pupil
Alexis I. duPont	2,934	$ 1,906	333	$ 1,735	206	241
Alfred I. duPont	10,668	880	154	783	93	110
Appoquinimink	2,386	178	31	852	101	68
Claymont	3,868	651	114	725	86	91
Conrad Area	6,864	325	57	1,024	121	89
De La Warr	4,309	373	65	545	65	61
Marshallton-McKean	4,697	397	69	938	113	88
Mount Pleasant	6,077	334	58	1,496	177	121
New Castle-G. Bedford	8,455	611	107	803	95	94
Newark	15,574	1,098	192	101	12	79
Stanton	6,159	826	144	295	35	74
Wilmington	15,178	432	75	1,553	184	131
Caesar Rodney	6,052	524	91	409	49	72
Capital	7,026	381	66	1,100	130	114
Lake Forest	3,273	302	53	666	79	75
Milford	4,158	501	87	440	52	80
Smyrna	2,780	681	119	551	65	94
Cape Henlopen	3,817	149	26	1,506	179	153
Delmar	663	273	48	885	105	107
Indian River	6,291	154	27	1,091	129	115
Laurel	2,168	84	15	755	92	78
Seaford	3,888	388	68	1,051	125	90
Woodbridge	2,169	148	26	649	77	72
Total	129,454	-----	---	-----	---	---
Average	-------	$ 573	100	$ 843	100	100

Source: Computed from Statistical Reports, State Board of Education and Department of Public Instruction, State of Delaware.

Equalization of school district fiscal capacity to meet educational needs is one goal of many legal actions currently underway in several states as an aftermath of the Serrano decision in California. Plaintiffs in these actions contend that valuation per pupil should not be the influential factor in determining the ability of school districts to fund educational needs, including school building needs. Wide variations do exist in this regard in Delaware, and even wider disparities than are shown in Table 8 would result had it not been for the heavy infusion of state funds in the Delaware school construction program.

Table 9 shows district debt service tax rates on actual assessed valuation and converted to full valuation. Also shown again is the relative ability index of each district. Per capita taxes for debt service have been equated to property tax rates in order to make valid comparisons among districts.

The range of debt service rates as applied to actual assessed valuation was from $0.12 for Cape Henelopen to $.738 for Laurel. On the basis of full valuation, Cape Henelopen's rate was $0.06 while Stanton's rate was $0.469. Again, the debt service rate is a consequence chiefly of the amount of bonded debt as related to assessed valuation. It may be recalled that Alexis I. duPont had more than three times the state average debt per pupil, but its high relative wealth allows for a modest debt service rate. On the other hand, Stanton, with relatively high debt per pupil and only 80 percent of average full valuation per pupil needed a high debt service rate.

TABLE 4-9

DEBT SERVICE TAX RATES PER $100 ON ASSESSED VALUE AND FULL VALUE OF REAL ESTATE AND CAPITATION TAXES, AND RELATIVE ABILITY INDEX, 1972-73

District	Debt Service Rate		Relative Ability Index Based on Full Valuation (100 is Average)
	Assessed Valuation	Full Valuation	
Alexis I. duPont	$ .35	$ .245	238
Alfred I. duPont	.43	.301	105
Appoquinimink	.23	.160	69
Claymont	.41	.287	93
Conrad Area	.23	.161	88
De La Warr	.50	.350	61
Marshallton-McKean	.57	.399	89
Mount Pleasant	.38	.266	124
New Castle-G. Bedford	.60	.42	86
Newark	.595	.4165	87
Stanton	.67	.469	80
Wilmington	.345*	.241*	123
Caesar Rodney	.627	.376	68
Capital	.28	.168	118
Lake Forest	.336	.201	73
Milford	.564	.309	83
Smyrna	.738	.451	88
Cape Henlopen	.12	.06	165
Delmar	.344	.172	108
Indian River	.16	.08	126
Laurel	.715	.358	74
Seaford	.465	.232	91
Woodbridge	.352	.181	71

*Includes minor capital outlay rate.

Source: Assessments and Tax Rates, Delaware Public Schools, 1972-73, Planning, Research and Evaluation Division, Department of Public Instruction, Dover, Delaware, pp. 8-11.

Table 10 presents individual Delaware school district rankings on full valuation, debt service rates, bonded debt, and debt leeway. Inspection of the table reveals a pattern of close relationship between a district's rank on valuation and its rank on debt leeway. It is also evident, with some glaring exceptions, that districts with low ranks on valuation per pupil rank high on relative debt service tax rates. Exceptions are caused by wide disparities in assessed valuation and by the fact that school building needs are random in nature and some districts have great need to issue bonds while others may not. Local aspirations also are influential, both in terms of deciding whether a building is needed and in determining features to be included.

FUTURE BUILDING NEEDS

It was shown previously (Table 3) that fewer than 25 percent of Delaware pupils were housed in facilities constructed prior to 1950. This fact is a tribute to the exemplary school construction program of Delaware. It also should prove to be of great significance in the determination of future school building needs in the state.

An October, 1971 study by staff of the Department of Public Instruction indicated that pupil enrollments in grades K-12 were expected to be 132,524 in 1976 which is a decrease of 1.84 percent from the 1971 enrollments. Kindergarten enrollments were expected to decline slowly through 1976, and then to swing upward again since the birth rate turned upward in 1969. (The 1969 upturn was not repeated nationally in any succeeding year, and

TABLE 4-10

RANKINGS OF DELAWARE SCHOOL DISTRICTS ON RELATIVE FULL VALUATION PER PUPIL, RELATIVE DEBT SERVICE TAX RATE, RELATIVE BONDED DEBT PER PUPIL, AND RELATIVE DEBT LEEWAY PER PUPIL

District	Rank on Relative Full Valuation Per Pupil	Rank on Relative Debt Service Tax Rate	Rank on Relative Bonded Debt Per Pupil	Rank on Relative Debt Leeway Per Pupil
Alexis I. duPont	1	13	1	1
Alfred I. duPont	7	10	3	13
Appoquinimink	22	21	19	11
Claymont	11	11	6	15
Conrad Area	13	20	16	8
De La Warr	23	8	14	18.5
Marshallton-McKean	14	5	11	9
Mount Pleasant	4	12	15	4
New Castle-G. Bedford	9.5	3	7	12
Newark	16	4	2	23
Stanton	19	1	4	22
Wilmington	3	14	10	2
Caesar Rodney	20.5	6	8	21
Capital	6	19	13	5
Lake Forest	18	16	17	16
Milford	15	9	9	20
Smyrna	9.5	2	5	18.5
Cape Henlopen	2	23	21.5	3
Delmar	8	18	18	10
Indian River	5	22	20	6
Laurel	17	7	23	14
Seaford	12	15	12	7
Woodbridge	20.5	17	21.5	17

Source: Computed from *Reports of Educational Statistics*, State Board of Education and Department of Public Instruction, State of Delaware.

in fact the rate was lower in 1971 than in any previous year.) Elementary enrollments were expected to decrease annually by an average of 2.17 percent. Increases were expected for grades 7-12 at an average rate of .89 percent annually. The increase in secondary school enrollments will not continue indefinitely, however, since the birth rate decline beginning in 1963 will ultimately lower grade by grade enrollments in secondary schools.[8]

Table 11 shows, for each Delaware school district, the results of a 1971 study by the Delaware State Planning Office. Projected utilization capacity for Fall, 1972 is shown along with projected 1975 enrollment for each district. Only five of the 26 districts were projected to have more pupils in 1975 than plant capacity in 1972 could accommodate.

The last column in Table 11 contains a comment, for each district, of pupil population prospects for 1975-80. The projected trend for each district, given in the Planning Office Study, was analyzed to derive the enrollment prospects for 1975-80. It can be noted that many districts will probably be experiencing a period of stability in enrollment; this can likely be attributed to the declining birth rate since 1963.

Eleven districts can expect declining enrollments, perhaps due to out-migration and the decline in the birth rate. Only the New Castle-G. Bedford and Newark districts are expected to increase in enrollment during the 1975-80 years, due to immigration.

Many of the school building projects currently planned and underway are designed for the replacement of obsolete buildings. Except for the Newark and New Castle-G. Bedford districts, replacement and upgrading of

TABLE 4-11

PROJECTED ENROLLMENT FOR 1975, PROJECTED PLANT CAPACITY FOR 1972, AND ENROLLMENT PROSPECTS 1975-80 FOR DELAWARE SCHOOL DISTRICTS.

District	Projected Utilization Capacity, 1972*	Projected Enrollment 1975**	Projected Excess of Pupils Over Capacity	Enrollment Prospects 1975-80
Alexis I. duPont	4,019	3,212	---	Stabilizing
Alfred I. duPont	12,330	11,865	---	Stabilizing
Appoquinimink	2,386	2,093	---	Declining
Claymont	4,793	3,954	---	Stabilizing
Conrad Area	6,198	5,962	---	Declining
De La Warr	4,749	3,432	---	Declining
Marshallton-McKean	4,950	4,613	---	Stabilizing
Mount Pleasant	6,128	5,844	---	Stabilizing
New Castle-G. Bedford	9,201	9,669	468	Increasing
Newark	17,490	16,886	---	Increasing
Stanton	6,717	5,957	---	Stabilizing
Wilmington	15,814	13,765	---	Declining
Caesar Rodney	6,472	6,114	---	Stabilizing
Capital	7,549	6,508	---	Declining
Lake Forest	3,539	3,054	---	Stabilizing
Milford	3,811	3,854	43	Declining
Smyrna	3,066	2,739	---	Stabilizing
Cape Henlopen	3,558	3,573	15	Declining
Delmar	608	778	170	Stabilizing
Indian River	5,491	5,896	405	Declining
Laurel	2,507	1,805	---	Declining
Seaford	4,189	3,805	---	Declining
Woodbridge	2,044	1,976	---	Declining

* Not including trainables.

** Adjusted for Voc.-Tech. students.

Source: 1971 School Facilities Planning Study, Delaware State Planning Office, Dover, September, 1971. Plant capacities and projected enrollments were given in the study. Enrollment prospects were derived by extrapolations of linear projections for each district.

older school plants will constitute the only school building needs for Delaware for the next few years, except for vocational-technical schools, which will represent a large share of the capital improvement budgets in the immediate future.

Below are Major Capital Project requests of Delaware school districts for 1974-79. These requests have not been evaluated by the school planning staff of the Department of Public Instruction.

Year	Total requests
1974	$ 19,307,000
1975	26,805,000
1976	24,752,000
1977	13,601,000
1978	19,055,000
1979	7,703,000

Amounts shown above, except for 1979, are comparable to totals authorized in the 1966-70 period. However, evaluation of these requests in light of what is currently happening in enrollments will likely prove that these requests are overestimates of the amounts required to meet needs.

EVALUATION OF DELAWARE PROGRAM FOR MAJOR CAPITAL IMPROVEMENTS

Educational Adequacy

The Delaware school construction program has succeeded in placing 75 percent of the pupils in plants built since 1950. Further, the evidence indicates that, for the state as a whole, the major building needs now are not to accommodate enrollment increases, but for upgrading and replacement of older school buildings.

The construction formulas currently in use to determine space allowances for new school construction are reasonably adequate. The approach used has the virtue of permitting local districts to have complete flexibility within the permitted total square footage allowance if districts can demonstrate that the space arrangements and allotments will meet the needs of the educational program and the number of pupils to be housed.

The formula approach, however, cannot work well for renovation of existing school buildings or for conversion of "found space" to educational purposes. Each project is unique and each decision has to be made on its own merits. One other problem arises, even in a state which supports capital outlay so generously as does Delaware. The requirement for local voter approval of the 40 percent share means that educational plant decisions may not necessarily be made solely on the merits, but may be decided on irrelevant bases.

Equalization

Any infusion of state funds into school construction projects provides some equalization, and Delaware, with relatively heavy state support, is among the leaders in the nation in terms of equalizing ability of local districts for provision of school buildings. However, some problems with equalization remain. Among these are:

1. The wide disparities in assessed valuation mean that some districts can easily afford to raise the local share and service debt incurred with modest tax rates. Other districts have little bond leeway and have relatively high debt service costs.

2. Some districts do not have the necessary local tax base to fund the local share of needed major school construction projects.[9]

3. A few districts in Delaware will have continuing need for new buildings to accommodate increased enrollment. Others will not. Assessed valuation increases may or may not provide sufficient local capability to finance the local share for needed projects in the growth areas.

Economy and Efficiency

That there is concern in Delaware for these aspects as related to school construction is evidenced by the recent Governor's Action Force Study on reducing school construction costs. The report of this study contains many suggestions which have merit.

Some of the concerns noted in the aforementioned study are:[10]

1. The length of time between determination of need and start of construction is often too long. Any time saving measures would reduce costs.

2. Lack of environmental conditioning (air cooling) prevents serious consideration of implementation of year-round school programs.

3. The existing incentive fee structure for architectural service may be counterproductive in that the higher the project cost, the higher the fee. Incentives for architects' fees based upon demonstrated savings could be devised.

4. Implementation of systems construction techniques is needed to reduce the amount of on-site labor, which is the cost component increasing most rapidly.
5. The Delaware labor preference act and the prevailing wage act may have the effect of stifling competition and not permitting free market economies from accruing to school facility construction. Any other legal provision which virtually mandates use of Delaware firms has the same effect.
6. Use of the construction management technique, which would break the major building bids down into much smaller components, could have the effect of fostering competition since smaller contractors are now precluded from bidding on jobs of large dollar volume.
7. Scheduling of state jobs more uniformly throughout the year could provide more uniform scheduling for craftsmen, and inspection could be improved by spreading competent inspectors over more jobs.
8. Since the interest component share of final school building costs is so high, consideration should be given to moving from reliance solely upon borrowed funds to a mixture of cash and borrowing. This suggestion has merit at both the state and local level if Delaware continues to finance buildings with both state and local funds.
9. The existing practice of identifying each district's project and total outside project cost in the Capital Improvements Act

is counter productive. Some projects will have been underestimated, and no flexibility exists to accommodate cost overruns. In other cases, potential bidders may use the authorization amount as a guide and then base their bids upon a fixed percentage of the authorization.

A lump-sum funding approach would be preferred, with projects named but amounts kept confidential. Discretion for acceptance of building bids could reside with competent state agencies. Contingency funds could be used to finance uncontrollable cost increases occurring subsequent to final estimates.

10. Provision should be made to use state funds for rental or purchase of existing space that is or can be made suitable for school purposes.

It has been mentioned earlier that the Department of Public Instruction is staffed with competent school plant planners. School districts should be required to use the available services of this staff to develop long-range school building plans more scientifically.

The recently enacted provision for state purchase of local district bonds is commendable. This action substitutes the credit of Delaware for that of local districts and smooths out the variations in net interest costs that would be incurred by individual districts.

MINOR CAPITAL IMPROVEMENTS AND PHYSICAL PLANT MAINTENANCE

Delaware also has established programs to provide state funds for minor capital outlay and for plant maintenance. Maintenance funds are provided entirely by the state and are for repair and replacement projects expected to extend the useful life of the facility by at least ten years. Apportionment is determined by a formula which currently allocates $9.00 for each year since the date of pupil occupancy of the building (up to a maximum of 30 years) multiplied by the full number of units of 25 full-time pupils housed in the building. For fiscal 1972, $690,500 was appropriated for this purpose.

The Minor Capital Improvement Program is designed for major maintenance of buildings and sites, renovations, alterations, modernization, remodeling, and rehabilitation. New construction, movable equipment and site improvements are excluded. Projects costing in excess of $50,000 in any one year program are transferred to the major construction program. Need must be justified to the State Board of Education and supported by pertinent back-up data. Long-range planning is a key element, since districts prepare a six-year budget which is revised annually as priorities change and as cost changes take place. The Minor Capital Outlay Program is also supported at the 60 percent level by the state, and districts usually levy property taxes to raise the local share, although it is legally possible to issue bonds for this purpose. Appropriated amounts (both state and local) for Minor Capital Improvements for recent years were:

1968 - $ 1,034,500

1969 - 1,158,000

1970 - 810,000

1971 - 1,436,000

The state provides 100 percent of the approved cost of school plant maintenance. In 1971-72 the state appropriated $690,000 for this purpose.

The Minor Capital Improvement Program and the allocation of state funds directly for plant maintenance again illustrate the concern Delaware has demonstrated for the local school districts' school housing problems.

MAJOR CONCLUSIONS

Several conclusions were given in the context of the description of the status of school building financing in Delaware. Key conclusions are set forth below as a prelude to stating recommendations for improvement of an already relatively superior system of financing school facilities.

1. The Delaware program, which has been sustained for many years, has included not only generous state support for construction, but also has accommodated the continuing need of local school districts to maintain and upgrade existing plants through the Maintenance and Minor Capital Improvement plans.
2. The program has resulted in housing more than 75 percent of all Delaware pupils in plants occupied since 1950. Yet this has been accomplished, largely because of state assumption of 60 percent of school building costs, without causing severe bonded debt burdens or extremely high debt service tax rates for most local districts.

3. The typical Delaware school district has sufficient debt leeway to permit construction of needed school buildings, but leeway is not uniform and relatively poor districts faced with a great need for buildings may be unable to raise the required local share.

4. The range of debt service tax rates was from 12 cents to 73.8 cents per $100 of taxables in 1972-73. On the basis of full valuation, the spread was from six cents to 46.9 cents per $100. While property valuation alone is not the sole determinant of the financial disparities among districts, since school building needs and local aspirations can also be influential, the six to one range of debt service rates on actual valuations and the eight to one range on full valuations strongly indicate that the program has failed to equalize fiscal burdens among the districts.

5. Projections of future enrollments indicate that the state, as a whole, will not need to contend with enrollment gains in the next few years and thus the need for new facilities will be diminished. A few districts will continue to need new plants to accommodate enrollment gains, however. Delaware should be in an excellent position to finance any needed upgrading of existing school facilities during the remainder of this decade, and if the state properly marshals its resources, replacement or rehabilitation of all obsolete buildings can be accomplished.

6. Certain actions could be taken to enable Delaware to get more for its school building dollar. Lump-sum appropriations, removal of barriers to competition, and heavier reliance upon DPI school facility specialists are examples of measures which could help achieve more economy and efficiency. Other suggestions along these lines were detailed in a preceding section of this report.

FOOTNOTES

1. Lindman, E. L.; Hutchins, C. D.; Morphet, E. L.; and Reller, T. L., State Provisions for Financing Public School Capital Outlay Programs, Federal Security Agency, Washington, D. C., 1951.

2. Barr, W. M.; Jordan, K. F.; Hudson, C. C.; Peterson, W. J.; and Wilkerson, W. R., Financing Public Elementary and Secondary School Facilities in the United States, Special Study No. 7, Chapter V, National Educational Finance Project, Bloomington, Indiana, 1970.

3. Ibid., Chapter V.

4. Annual Report, 1963-64, State Superintendent of Public Instruction, State of Delaware, Dover, 1964, p. 27.

5. Moody's Municipal and Government Manual, 1972, Moody's Investors Service, New York.

6. Recommendations for Reducing School Construction Costs in the State of Delaware, Governor's Action Force on School Construction in Delaware, Dover, February, 1971, pp. 3-46.

7. Ibid., Appendix p. 27.

8. Projections of Public School Enrollments and Units of Pupils (1972-1976), Planning Research, and Evaluation Division, Department of Public Instruction, Dover, October, 1971, p. 1.

9. Recommendations for Reducing School Comfort Costs in the State of Delaware, op. cit., pp. 3-47.

10. Ibid., pp. 3-1 to 3-54.

SECTION 5

AN ANALYSIS AND ASSESSMENT OF DELAWARE'S PUPIL TRANSPORTATION PROGRAM

Lloyd E. Frohreich
University of Wisconsin

This is a report of an applied research project conducted in the state of Delaware. The Delaware Department of Public Instruction was interested indetermining what changes and improvements should be made in its state pupil transportation program relative to economic efficiency, the distribution of transportation support, serving clientele needs, and overall program structure. The report contains a discussion of a few historical antecedents, recent studies of the state pupil transportation program, magnitude of the program, pupil transportation projections, pupil transportation costs, description of the program, program and cost comparison, and findings, conclusions and recommendations.

HISTORICAL ANTECEDENTS

Following the example set by their forefathers who made Delaware the "First State" or the first of the thirteen original colonies to ratify the Federal Constitution, succeeding legislators and state officials have established the principle that the state shall have primary responsibility for the support of public elementary and secondary school education, including the transportation of children. The tradition of extensive state involvement in the financial support of education has been maintained throughout the history of Delaware. Data for the 1971-72 school year indicate that the state contributed 69.4 percent of the revenue for public elementary and secondary schools.[1]

The 1921 Delaware school laws acknowledged the principle that education was a function of state government.[2] Pupil transportation rules and regulations were established the same year. A 1926 annual report revealed that Delaware was the only state in which the cost of transporting pupils was paid entirely from state funds.[3] By 1931 the Department of Public Instruction employed a supervisor of transportation and in 1955 added an assistant supervisor.[4]

Concommitant with its commitment to education in general, the state's financial support of the pupil transportation program has continued at a high level. The state presently supports 100 percent of the approved formula cost of transporting children.

RECENT STUDIES OF THE TRANSPORTATION PROGRAM

The highlights of two recent studies of Delaware's pupil transportation program will be reviewed briefly on the assumption that such a review will contribute to an understanding of the past and present transportation program and its policies. The two studies are "Report on Pupil Transportation Recommendations for the State of Delaware" authored by Medlyn and Stapley in 1966 and "Study of School Bus Transportation in Northern Delaware, Phase I" conducted by Simpson and Curtin in April, 1972.

A few of the important recommendations resulting from the 1966 study were:

1. The establishment of locally supervised districts.
2. State regulation and assistance in securing a quality transportation program.
3. Replacement of contract and lease operations with public ownership of buses.
4. Underwrite the cost of a standard program, i.e., the support of a minimum standard transportation program.
5. Develop a planned purchase system of buses as the state moves toward public ownership.
6. Investigate computer routing and scheduling.
7. Include curricular enrichment trips as a part of the basic minimum but adequate program.

Essentially, recommendations, 1, 2, 5 and 6 were implemented and/or are a part of the existing pupil transportation program. The recommendation to move toward greater public ownership of buses has received some impetus in northern Delaware but the state has not seen fit to adopt the policy of public ownership nor the essence of the recommendation made in the report. Recommendation number 4 was intended for implementation along with the shift toward public ownership. The state presently supports a basic transportation program but the level of support is 100 percent of an approved formula program, and this by definition is nearly the total of all local transportation costs. The inclusion of curricular enrichment transportation costs in the approved formula cost has not been endorsed to date by the state. Program enrichment costs are borne by local school districts, except that in districts where district and/or state owned buses are used for the regular transportation program, the district bears only the cost of a driver and operational costs for enrichment trips. Other districts which do not have access to public-owned vehicles must use contract vehicles for such trips.

The principle arguments presented in the 1966 report were for more efficiency and economy in the state transportation program through enactments of recommendations that would culminate in more local decision-making, control, and assumption of transportation costs. In addition, the study endorsed the use of lineal density factors (number of children per mile of bus route) as an efficiency check when comparing per pupil costs. Many studies have noted the high correlation between pupil lineal density and cost per pupil and indeed a few states are using this factor in their formulas for distributing state transportation dollars to local districts. More comprehensive treatment of these and other factors will appear later in this report.

Simpson and Curtin assumed the task of testing the feasibility of a joint venture or a proportionately greater use of municipal transit vehicles, specifically the Delaware Authority for Regional Transit (DART) which operates in northern Delaware. The basic conclusion of this study is embodied in the following statement.

> Operation of district school bus routes by DART appears impractical and not economically feasible. Even with necessary legislation changes required to permit the use of DART equipment, resulting savings, based on the total pupils DART could reasonably accommodate due to equipment restraint would be negligible. Any resultant savings could be overshadowed by other operating problems resulting from the integration of DART service with present school bus operation.[5]

There have been and will be many problems associated with joint transportation services provided between school districts and municipal transit authorities, not the least of which are operational conflicts involving the establishment of routes and the provision for adequate safety precautions. However, it is known that several districts in other states do have harmonious joint pupil transportation programs, particularly where public and private transit systems must be subsidized heavily with tax money and where these systems are frantically seeking means of increasing ridership.

It seemed, as one studied this report, that the writers were assuming that DART would be unwilling or unable to change its present operation to accommodate the transportation of any school children. This is a questionable assumption unless DART is financially solvent and is not seeking to expand its operation and ridership. One obvious alternative, assuming the legal and statutory constraints are eliminated, is that DART serve as a contractor (much the same as other private contractors), purchase school buses, and provide maintenance and operation with the usual reimbursement features of the state formula in effect. The use of present DART storage and maintenance facilities, assuming they are not presently utilized to capacity, could reduce state transportation costs somewhat.

The study's recommended use of unused DART facilities for the storage of district-owned buses to prevent vandalism is a worthwhile consideration these districts should explore. To carry this one step further, the possibility of a joint maintenance operation, between the school district and DART, for district-owned buses is another avenue worth exploring. For those districts with a small fleet of district owned buses, a joint venture of this type may be economically advantageous to both parties, particularly where the district has inadequate maintenance facilities and DART's maintenance operations are not utilized fully at present.

Another study was conducted on the feasibility of using computers for establishing pupil transportation routes. It was concluded that little would be gained by using computers since the present system of establishing routes allowed for very individualized attention and analysis. Essentially, the computer program tested arrived at the same array of route patterns presently in operation. If the regional transportation directors can continue to give very individualized attention to the establishment of route patterns, there is no question that this is a preferable mode of operation and computer routing would not be necessary. The system for the present establishment of routes can uniquely solve many atypical problems the computer program is ill-equipped to handle. However, in very large operations and with an expanding transportation program, the state may want to consider computer routing in the future for the purpose of establishing standard routes and reducing the load on some of its over-burdened regional transportation directors.

PRESENT AND PROJECTED MAGNITUDE OF THE TRANSPORTATION PROGRAM

A desired component in this study was an examination of the past and present magnitude of the pupil transportation program with the obvious intent of using trends as a portent of future magnitude and need. Therefore, evidence will be presented indicating the past and present numbers of pupils transported, the percentage of all pupils transported, past and current transportation expenditures and yearly changes in these variables over the recent past.

Pupils Transported

TABLE 5-1

TOTAL PUBLIC SCHOOL CHILDREN TRANSPORTED, BY COUNTY, 1968-69 THROUGH 1971-72

County	1968-69	1969-70	1970-71	1971-72
New Castle	32,219	38,536	41,001	44,169
Kent	14,840	17,919	17,228	18,926
Sussex	14,309	15,020	16,087	16,742
Total	61,368	71,475	74,316	79,837
Percent increase over previous year		16.47%	3.97%	7.43%

In Table 1 are reported total public school children transported in each county for the past four years. These totals include all regular pupils, special education pupils and vocational-technical students. After substantial increases in the number of pupils transported in the early and middle 1960's, ridership has leveled off to more reasonable increases in the late 1960's and early 1970's. Although percentage increases are not shown for each county in the table, it may be reported that New Castle County increased its ridership by 11,950 pupils between 1968-69 and 1971-72, a 37.1 percent increase. Kent County increased its ridership 27.5 percent and Sussex County 17.0 percent during the same four-year period. Total ridership increased 18,469 or 30.1 percent during this period, indicating the fastest growth in number of pupils transported occurred in New Castle County, the most populous county in Delaware.

TABLE 5-2

TOTAL NONPUBLIC SCHOOL CHILDREN TRANSPORTED, 1968-69 THROUGH 1971-72

Classification	1968-69	1960-70	1970-71	1971-72
Catholic	4,356	4,666	6,993	7,627
Private	228	290	1,773	1,801
Total	4,585	4,956	8,766	9,428
Percent increase over previous year		8.09%	76.88%	7.55%

In Table 2 are reported the number of nonpublic school children transported over the past four years. The sizeable increase in ridership between 1969-70 and 1970-71 may be attributed primarily to the incorporation of a policy that the transportation of nonpublic school children is a responsibility of the state. Recognition of this responsibility resulted in substantial increases in the dollar reimbursement to nonpublic schools, thus leading to greater claims for reimbursement and nonpublic school ridership. The Catholic schools increased ridership by 75.1 percent during this four-year period while private schools increased ridership 689.9 percent.

If the data in Tables 1 and 2 were combined, one would note that total public and nonpublic ridership increased 10,478 or 15.9 percent between 1968-69 and 1969-70, 6,651 or 8.7 percent between 1969-70 and 1970-71, and 6,183 or 7.4 percent between 1970-71 and 1971-72.

Another dimension of the magnitude of Delaware's transportation program is the distribution of ridership among the regular, special, and vocational-technical categories of students transported. The transportation of regular pupils is accommodated with regular equipment as opposed to the transportation of special education pupils which may require special buses, longer trips and the employment of supervisory personnel in addition to the driver. Each of these variables and the associated costs depend on the nature of the handicap and the location of schools to educate such children. It has been well established that the costs of transporting special education children exceed substantially the costs of transporting regular children. The transportation of vocational-technical pupils also may increase total transportation costs. Transportation of these students to special schools often results in secondary trips and extended mileage due to the location of vocational-technical high schools and programs.

In Table 3 are reported the students transported according to categories for the years 1968-69 through 1971-72. During this period the transportation of regular pupils increased by 15,580 or 26.6 percent while the combined special and vocational-technical student ridership increased by 2,889 or

TABLE 5-3

PUBLIC SCHOOL STUDENTS TRANSPORTED, BY CATEGORY,
1968-69 THROUGH 1971-72

Category	1968-69	1969-70	1970-71	1971-72
Regular	58,521	68,022	70,288	74,001
Special	2,847	1,231	1,237	1,208
Voc-Tech	Combined	2,222	2,791	4,528
Total	61,368	71,475	74,316	79,837

101.4 percent. It is interesting to note, however, that the number of special students transported actually has declined slightly in the last three years while the number of vocational-technical students transported increased 2,306 between 1969-70 and 1971-72. The distribution of ridership among these categories and the trends in each illustrates the necessity of keeping a critical eye on the plans for new programs in each of these categories.

Pupils Enrolled

To get an accurate picture of the relationship between pupils transported and pupils enrolled in each county in the state, the enrollment patterns in each of the three counties in Delaware are presented in Table 4.

Over the past four years New Castle County has increased its enrollment by actual count more than the other two counties combined. However, it is interesting that the percentage increase over the last four years has been faster in Kent County (12.8 percent) than in either New Castle County (8.26 percent) or Sussex County (3.1 percent).

TABLE 5-4

PUBLIC SCHOOL ENROLLMENTS, BY COUNTY, 1968-69 THROUGH 1971-72

County	1968-69	1969-70	1970-71	1971-72
New Castle	83,091	86,769	88,164	89,956
Kent	22,859	24,866	25,585	25,787
Sussex	18,690	18,836	18,996	19,270
Total	124,640	130,471	132,745	135,013
Percent increase over previous year	7.84%	4.68%	1.74%	1.71%

TABLE 5-5

NONPUBLIC SCHOOL ENROLLMENTS 1968-69 THROUGH 1971-72

	1968-69	1969-70	1970-71	1971-72
Total Enrollment	19,214	19,021	18,604	18,471
Percent decrease over previous year	-1.71%	-1.00%	-2.19%	- .71%

The data in Table V indicate the diminishing enrollments of nonpublic schools in Delaware. The decreases have been slight in each of the last four years and enrollments would appear to be leveling off, if the decrease in 1971-72 is indicative. Barring future financial crises, nonpublic school enrollments in Delaware should remain relatively stable or decline slightly in the near future.

Transported Students as a Percentage of Enrollments

What has been the trend in the transportation of both private and public school students relative to enrollments? In Table 6 are presented the percentages of students transported in public and nonpublic schools. Each figure represents the number of pupils transported as a percentage of the enrollment in each of the respective categories. It is apparent that ridership as a percentage of enrollment in Delaware has increased each year of the last four years. How long this trend will continue cannot be determined with the present information and data. It may be assumed, however, that if qualifications for ridership lessen (i.e., mileage limits are reduced) or if more students continue to qualify under the umbrella of unique problems or hazards, the percentage of enrolled students that are eligible for transportation will place an increasing load on the transportation budget of the state.

PUPIL TRANSPORTATION PROJECTIONS

With the data from Table 6 on students transported as a percentage of enrollments and the data from Table 7 on projected enrollments, some projections were made of the number of pupils that will need transportation in the immediate years ahead.

TABLE 5-6

PUBLIC AND NONPUBLIC RIDERSHIP AS A PERCENTAGE OF
PUBLIC AND NONPUBLIC ENROLLMENT, 1968-69 THROUGH 1971-72

Source	1968-69	1969-70	1970-71	1971-72
New Castle County	38.78%	44.41%	46.50%	49.10%
Kent County	64.92%	72.06%	67.34%	73.39%
Sussex County	76.56%	79.74%	84.69%	86.88%
Total Public	49.24%	54.78%	55.98%	59.13%
Total Nonpublic	23.86%	26.06%	47.12%	51.04%
Total Public and Nonpublic	45.85%	51.13%	54.89%	58.16%

The Division of Planning, Research and Evaluation of the Delaware Department of Public Instruction has projected a decline of approximately 1,889 public school students in Delaware between 1973-74 and 1976-77. If the percentage of students transported relative to enrollments does not increase, the data in the Table 8 on projected ridership should be fairly accurate.

TABLE 5-7

PROJECTED PUBLIC SCHOOL ENROLLMENTS IN THE STATE OF DELAWARE, 1973-74 THROUGH 1976-77

Level	1973-74	1974-75	1975-76	1976-77
Kindergarten	8,620	8,920	9,200	9,500
1 - 6	58,415	56,861	55,722	54,858
7 - 12	61,696	61,891	62,066	62,046
Specials	5,682	5,846	5,986	6,120
Total	134,413	133,518	132,974	132,524
Percent Decrease over previous year	-.32%	-.67%	-.41%	-.34%

1) These projections were taken from "Projections of Public School Enrollments and Units of Pupils (1972-1976)," Planning, Research and Evaluation Division (Department of Public Instruction, Dover, Delaware), October, 1971, Table 1, p. 7.

2) The projected enrollments include Dover Air Force Base.

TABLE 5-8

PROJECTIONS OF THE NUMBER OF TRANSPORTED PUBLIC AND NONPUBLIC SCHOOL STUDENTS, 1973-74 THROUGH 1976-77

	1973-74	1974-75	1975-76	1976-77
Public[1]	80,648	80,111	79,784	79,514
Nonpublic[2]	9,384	9,384	9,384	9,384
Total	90,032	89,495	89,168	88,898

1) The ridership estimates are based on a 60 percent rider to enrollment ratio in public schools.

2) The ridership estimates are based on a 51 percent rider to enrollment ratio in nonpublic schools. Lacking specific evidence on nonpublic school enrollment projections, it is estimated that enrollments will stabilize at 18,400 in the immediate future.

The number of pupils transported may be expected to decline over the next four years if the figures in Table 8 are accurate. There are many factors which can change these projections. Increasing rather than declining enrollments in the public and nonpublic schools, increasing the percentage of transported students relative to enrollments, and changes in present educational program configurations would alter the projections. The Transportation Division of the Department of Public Instruction should watch these factors closely as it plans future operations and budgets.

Both state and local public school officials are in a favorable position for evaluating present transportation policies as well as other educational policies because they will not have to be concerned incessantly with increasing enrollments and the attendant problems associated with rising birth rates. Stabilized birth rates should bring on an era in which schools can plan, implement and allocate resources to programs on the basis of merit, benefit, and equal opportunity without expending valuable time on decisions related to the demands of higher enrollments.

PUPIL TRANSPORTATION COSTS

Another dimension of the magnitude of a pupil transportation program is its cost. The total state reimbursed transportation costs in each county will be presented along with state reimbursed private and parochial school transportation costs. The costs shown are only for those capital and operational expenditures which were reimbursed by the state. Certain local costs are not shown, such as those expenditures incurred in transporting students for educational or extracurricular related activities.

Those costs borne by the state for the transportation of public school students are shown in Table 9. The rate of increase in total costs has declined in more recent years. When the rate of increase in total costs is compared with the rate of increase in ridership of public school students (Table 1), it may be noted that total costs increased much faster than ridership increases except when the last two years are compared. This comparison indicated the increase in pupils transported was 7.43 percent while costs increased 8.68 percent.

One noteworthy trend is the greater rate of increase in local costs over contract costs. Local costs in 1971-72 constituted 17.33 percent of the total transportation costs, up from 5.82 percent in 1968-69. A greater reliance on public owned equipment is evident particularly in New Castle County where local costs made up 29.22 percent of total transportation costs, whereas in Kent County and Sussex County local costs were respectively 5.18 percent and .56 percent of total costs in each of those counties in 1971-72.

Nonpublic pupil transportation costs for a four year period are shown in Table 10. There were substantial increases in state outlays for the transportation of nonpublic school students each of the four years shown. A comparison of the rate of total cost increase with rate of increase in pupils transported (Table 2) reveals that cost rate increases exceed ridership increases each year. Increased costs borne by the state for the transportation of nonpublic school pupils is attributable to several factors: changes in the distribution formula, increased ridership, inflation, etc.

TABLE 5-9

PUBLIC PUPIL TRANSPORTATION COSTS, BY COUNTY, 1968-69 THROUGH 1971-72

County	1968-69		1969-70		1970-71		1971-72	
	Contract[1]	Local[2]	Contract	Local	Contract	Local	Contract	Local
New Castle	$1,613,443	$186,055	$2,017,485	$313,502	$2,388,743	$413,408	$2,228,765	$920,167
Kent	801,567	14,500	1,149,592	22,094	1,200,507	23,654	1,224,100	66,902
Sussex	868,145	2,435	1,177,780	2,613	1,251,018	3,378	1,292,004	7,275
Total	$3,283,155	$202,990	$4,344,857	$338,209	$4,840,268	$440,440	$4,744,869	$994,344
Yearly Total	$3,486,145		$4,683,066		$5,280,708		$5,739,213	
Percent increase over previous year	---		34.33%		12.76%		8.68%	

1) Contracted costs are those costs assumed by the state for the privately contracted transportation of pupils.

2) Local costs are those costs assumed by the state for the administration and operation of locally owned, jointly owned, or leased buses.

TABLE 5-10

NONPUBLIC PUPIL TRANSPORTATION COSTS, 1968-69 THROUGH 1971-72[1]

Classification	1968-69	1969-70	1970-71	1971-72
Catholic	$202,551	$273,246	$387,860	$518,219
Private	30,076	33,957	105,302	95,255
Total	232,627	307,203	493,162	613,474
Percent increase over previous year	----	32.06%	60.53%	24.4%

1) Reimbursed expenditures provided from the state. There may be additional local costs not reported herein.

The data in Table 11 reveal total public and nonpublic costs and total number of students transported over a recent four-year span. There were considerable changes in the state transportation program and reimbursement formula which help explain the higher rate of increase in costs to ridership rate increases for this period.

DESCRIPTION OF THE PROGRAM OF STATE FINANCING

Each year the Delaware State Board of Education approves a "Transportation Reimbursement Formula" for both private contractors and school districts operating district owned or lease-purchase buses. Essentially, there are three options open to local school districts.

1. A school district may operate district owned buses and then be reimbursed by the state in accordance with the distribution formula for district operation.

TABLE 5-11

COMBINED PUBLIC AND NONPUBLIC STATE TRANSPORTATION COSTS, 1968-69 THROUGH 1971-72

Year	1968-69	1969-70	1970-71	1971-72
Total Costs	$3,718,772	$4,990,269	$5,773,870	$6,352,682
Percent increase over previous year	----	34.19%	15.70%	10.02%
Number Transported	65,953	76,431	83,082	89,265
Percent increase over previous year	----	15.89%	8.70%	7.44%

2. A school district may lease buses, provide its own drivers and then be reimbursed by the state in accordance with the distribution formula for district operation.

3. A school district may contract transportation services with the private sector and then be reimbursed by the state up to the approved formula for contract operations.

A fourth option is available to local districts but it is not used to any degree. A local district may bid for transportation services but will be reimbursed only up to the amount approved under the existing transportation formula.

Reimbursement for Local Operations[6]

The formula for local operations (non-contract) is used to calculate state support for district owned, leased, lease-purchase, and installment-purchase arrangements.. In 1971-72 (the most recent figures available) 45 buses (4.3 percent) were district owned, 43 buses (4.3 percent) were leased, 77 buses (7.6 percent) were lease-purchase, and 4 buses (.4 percent) were rented. A total of 847 buses (83.4 percent) were operated on a contract basis.

Present arrangements provide that equipment be purchased by the State Board of Education and titled under a joint ownership system with the district to which it is assigned with the provision that the state be allowed to reassign a bus if it is no longer needed in a district.

There are several components of the distribution formula for locally operated buses and these components are discussed below. The costs indicated in each case are the state approved formula costs for 1972-73.

Fixed Charges. Fixed charges under the present formula consist of allowances for bus storage ($120 per year), driver's physical exam ($10 per year), and bus inspection ($10 per year) for a total allowance of $140 per year or $.78 per diem rate. Maintaining facilities for storage, parking and maintenance are the responsibility of the local district.

Operation Allowances. Operation allowances are for driver's wages, gas, oil, tires, and maintenance and are reimbursed according to two formulas: a formula if the bus is operated north of the canal and a formula if the bus is operated south of the canal. To increase the efficiency of operation the formula was set to reimburse trips which meets a 40 mile minimum per day. A basic daily amount is provided plus an additional per mile allotment for 41-70 mile trips and over 70 mile trips.

1. South of the canal a 72 passenger bus would receive $17.43 per day basic operation allowance plus $.39 per mile for each mile between 41 and 70 and $.19 per mile for each mile over 70.

2. North of the canal a 72 passenger bus would receive $19.39 per day basic operation allowance plus the same allowance per mile above 40 miles as south of the canal.

The capacity of the bus is a factor in calculating operation allowances. Drivers' salaries remain constant but the allowance for other operational costs decreases as the capacity of the bus is reduced.

Administrative Allowance. The administrative allowance for a 72 passenger bus is $1.82 per day or $327.60 a year for a standard 180 day operating period. This amount equals approximately 10 percent of combined fixed charges and operation costs. For a 72 passenger bus operated south of the canal, $.78 per day fixed charges plus $17.43 per day basic operation allowance times 10 percent equals the $1.82 per day administrative allowance. Smaller buses would receive proportionately less.

In addition to the reimbursement component described above, the state has provided for other costs. Layover time allowances of $1.65 per hour are made for situations in which it is less expensive to pay the layover cost than the cost to transport a bus back home. Layover time allowances generally are given for transporting vocational-technical students to a centrally located school. Operation allowances are provided for midday trips which may result from half-day sessions, kindergarten trips, and double sessions. These allowances for a 72 passenger bus, for example, would be $9.83 basic trip amount plus $.495 per mile and $.98 per trip for administration.

Attendant wages are paid for routes on which the buses have a seating capacity of more than 15 pupils and are used to transport handicapped pupils. The allowance varies from $2.10 to $2.46 per hour depending on the attendant's number of years of experience. Other formula allowances are made for sick leave and substitute drivers.

Insurance for district operated buses is provided through the State Insurance Commissioner's Office and licenses are furnished by the State Motor Vehicle Department. The state allows the use of one spare bus for each 10 buses the local district owns, leases or lease-purchases. The maintenance and operation costs of the spare vehicle are costs the local district must incur. Buses may be replaced upon determination by the State Supervisor of Pupil Transportation that the bus is 10 model years old or has operated at least 90,000 miles.

Reimbursement for Contract Operations[7]

The differences in the formula for reimbursing local districts for contract operations and local district operations rest with the allowance for depreciation on private vehicles and costs that private operators must pay that are not paid by public agencies.

Depreciation Costs. Depreciation costs reimbursed for contract operations take into consideration an annual depreciation factor and a factor for the interest on the investment. For example, a 72 passenger bus whose purchase price was $9,500 (1972 cost) would be depreciated over a 10 year period giving a depreciation allowance of $950 per year. A current interest rate of 5.5% is used to calculate the interest on the investment or 5.5% x $9,500 = $522.50. The total yearly reimbursement for this vehicle for the capital investment incurred by the private contractor would be $1,472.50 or $8.18 per diem for a 180 day operation.

Fixed Charges. The allowance for fixed charges is greater for contract operations because of the additional cost incurred by the private owner for the bus license (costed according to vehicle weight) and insurance. Public owned or leased buses do not pay these costs. Allowances for storage, physical exam, and inspection are the same for both private and public operations. Insurance allowances for private contractors vary depending on the region in which the bus operates. Insurance costs are higher in more heavily populated areas, i.e., Wilmington and north of the canal.

Operation Allowance. Private contractors are allowed an additional allotment to pay for Workmen's Compensation, Unemployment Insurance and Social Security. These costs are not incurred by public school districts. For both private and public operations (south of the canal) the basic 40 mile reimbursement ($17.93 for a privately owned 72 passenger bus) which includes the driver's pay is based on three minutes per mile, 20 miles per hour and 30 minutes driver preparation time. Thus, a 40 mile route would allow two hours travel time plus 30 minutes bus preparation time or 2.5 hours. North of the canal an additional half hour travel time is allowed because of more traffic congestion. The number of hours multiplied times the wage scale per hour, which depends on the geographic location of the route, would provide the total allowance for a driver's salary as a part of the basic allowance.

Administrative Allowance. The administrative allowance is less for district operations than for contractor operations. As the allowance is based on 10 percent of the per diem rate and the per diem rate for district operations is less than the per diem rate for private operations, the administrative allowance for private contractors is greater. It should be noted, however, that the 10 percent administrative allowance is based on per diem operating costs calculated on buses operating south of the canal. Therefore, the administrative allowance (for 1972-73) for operation (since the operating costs are higher) does not quite reach 10 percent of per diem operating costs in districts north of the canal.

Although the total per diem allowances for public operations contains no provision for depreciation costs, it may be noted that total reimbursement costs for contracted bus services exceed public transportation reimbursement costs by approximately 55 percent. A comparison of the costs of a typical 66 passenger bus operating on a 40 mile route, as they relate to public and private operations both north and south of the canal, are shown in Table 12.

Reimbursement Provisions for Nonpublic Schools, Public Carriers and Private Autos

The state policy with respect to reimbursing nonpublic schools for transporting their pupils is to allocate a dollar amount per pupil based on the previous year's average cost of transporting a pupil in the public schools. The 1971-72 average cost of transporting a public school student was $72, therefore, nonpublic schools will receive $72 per transported pupil for the 1972-73 school year or $7.20 per month per student.

TABLE 5-12

COMPARISON OF ALLOCATION COSTS[1] FOR PUBLIC
SCHOOL OPERATIONS VS PRIVATE CONTRACT OPERATIONS

	1972 - 66 Passenger Bus - 40 Mile Daily Route			
Formula Variables	North of Canal		South of Canal	
	Public	Private	Public	Private
Depreciation	$ --	$ 7.75	$ --	$ 7.75
Fixed Charged	.78	2.79	.78	2.11
Operation	19.19	20.35	17.23	18.15
Administration	1.80	2.77	1.80	2.77
Total per diem allowance	21.77	33.66	19.81	30.78
180 day allowance	$3,918.60	$6,058.80	$3,565.80	$5,540.40

1) Formula variable costs are shown on a per diem basis.

When general public carriers are used to transport qualified students (students in grades 1-6 who live more than one mile from school and students in grades 7-12 who live more than 2 miles), reimbursement is based on the actual number of bus tickets used for transportation to and from school with a maximum allowance of $54 per year per student. When there is no provision for district, public, or contract service, the qualified student may be transported by private auto and reimbursed $.10 per mile, not to exceed $72 per year per pupil.

In addition to the provisions mentioned above, there is a proviso that allows the reimbursement of districts which transport pupils who live less than the stipulated mileage from school because of unique traffic hazards. Delaware has a "Unique Pedestrian Hazards Committee" which is constituted to pass judgment on special cases of students who believe there are extenuating circumstances (traffic hazards) which qualify them for bus transportation. If the committee passes favorably on the student's or parent's request, the school district must make arrangements to transport that student and in turn is reimbursed from the state for the costs. There presently are approximately 3,000 pupils that meet the unique hazards standard set forth by the Committee and are being transported by local districts or under some other arrangements that meets with the state's approval for reimbursement.

Transportation Supervisors

There presently are 26 school districts in Delaware. Many of these districts are too small to utilize the services of a transportation director. A few years ago the state adopted a system whereby a District Transportation Supervisor was assigned on the basis of every 7,000 pupils transported, thus, a supervisor may be serving more than one school district. The supervisor is paid by the state but a local district(s) may supplement his salary to any agreed level. The District Supervisor serves a vital role in providing a link between the state and local districts, planning routes, arranging for private contracts, maintaining transportation records, teaching driver orientation courses and performing many other functions under the direction of the State Transportation Director. Presently there are 14 District Supervisors of transportation in Delaware.

School Bus Drivers

House Bill No. 627 passed by the 124th General Assembly required that all school bus drivers must take an eight hour driver training course before they can be fully licensed. These courses are offered on a regular basis under the auspices of the State Transportation Division of the Department of Public Instruction and are taught primarily by District Transportation Supervisors. The driver manual that was developed for this course contains an extensive amount of information on such topics as state traffic laws, defensive driving, child behavior and discipline, emergencies, accidents, bus maintenance and the physical, mental and emotional aspects of driving a school bus. Those who attend the eight hour training course are reimbursed by the state.

No person under 18 or over 70 years of age is allowed to drive a school bus or public vehicle in Delaware. Each driver must pass a physical and eye exam each year to retain a valid license. Women bus drivers constitute roughly 40 percent of the total population of school bus drivers in Delaware.

Provisions for Safety and Vehicle Inspection

Delaware state law provides that all school buses must pass a semi-annual inspection. These inspections presently cost the owners $10 per bus per inspection, of which $10 per year is paid for by the state under the formula provisions. The state has an extensive array of bus chassis and body specifications that must be met by manufacturers of buses sold in Delaware. These specifications and others would appear to meet the letter and intent of the "Standard 17 Requirements" recently prescribed by the Transportation Office of the Federal Government.

Safety records are kept in the state office of Transportation of the Department of Public Instruction. State safety records are compiled from state police reports which are made out at the scene of an accident or shortly thereafter depending on the severity of the accident.

Although the fatality role in the United States is only .05 to .06 per 100 million passenger miles for school buses, states constantly should be aware of safety records and means of reducing pupil-transportation related accidents.

PROGRAM AND COST COMPARISONS

The hazards and inadequacies of generating program and cost comparisons of transportation systems are multitudinous. There are inadequacies with each system of cost accounting and with the unit cost systems that have been used in the last fifty years. It is difficult to determine exactly what is or should be contained in a standard transportation cost figure. Are all depreciation costs, capital outlay, drivers' salaries, maintenance costs, operating costs, and insurance costs a part of a unit cost determination? When program costs are generated do they include all programs such as the transportation of special education pupils, summer session students, kindergarten students, vocational-technical students, and federal program students? These are difficult questions to answer and very few states keep program and cost records adequate enough to provide data for making comparisons.

Standard Cost Units

The following are the more common standard cost units and records school districts compile and a few of the advantages and disadvantages of each.

Average Cost Per Pupil is derived by dividing total transportation costs in a school district or a state by the number of pupils transported. The fallacies of this calculation are that it does not take into consideration the density of population, miles the student is transported, number of school days, or traffic conditions. A comparison of district or state per pupil costs would have to consider each of the factors to make any valid judgments. The per pupil costs generally are going to be more if the density of the transported student population is less, students are transported more miles, traffic congestion is heavy, and the number of school days is greater relative to other transportation programs.

Average Cost Per Mile is derived by dividing the total transportation costs in a school district or state by the number of miles the buses travel in a year. Standard cost comparisons using cost per mile fail to take account of density of population, number of pick-up points, number of students transported, or traffic congestion. Costs per mile are likely to be higher if the density of the transported pupil population is greater, number of pick-up points per mile is greater, and traffic congestion is heavier relative to other transportation programs.

Average Cost Per Day does not consider the number of pupils transported, density of the population, number of pick-up points, or traffic congestion. This standard cost unit is likely to be higher if the number of pupils is greater, density of the transported population is greater, number of pick-up points per mile is greater, and traffic congestion is heavier relative to other transportation programs.

Each of these variables has weaknesses but can be made more viable for comparison purposes if the comparison takes into account those factors that influence its cost. Average cost per pupil data may be comparable if one takes into account (holds constant) the factors that influence its magnitude, i.e., number of school days, density of transported population, geographic price levels, etc. One way of holding a factor constant is to include it in the calculation. The cost variable "average cost per pupil bus mile" standardizes two units on a cost basis: number of pupils and miles transported. However, this cost unit is so infinitesimal that comparisons seem ludicrous to those who analyze them. By far, the most efficacious means of making comparisons is to gather data on all the factors that influence cost and then compare the unit costs in a situation where the influence factors are relatively equal. Unfortunately, few states compile data this comprehensively, thus making comparability almost impractical. The arguments against gathering data on all relevant transportation factors centers on the expense on such data gathering processes and the utility of the cost units after they are calculated. The latter argument seems a bit out of place in this day and age of accountability, efficiency and economy in government.

In summary then, there are many factors that influence the cost variables used by school districts and states to make comparisons. The following list is presented to indicate those factors that have been mentioned plus other factors that should be given more attention.

Number of school days
Number of pick-up points per mile
Density of transported population
Number of pupils
Number of miles
Travel conditions
Geographic price differentials
Eligibility mileage limits
Number of buses
Number of trips
Bus capacity utilization

Standard Program Units

The problem of standard cost units is compounded with a lack of comparability among program units. Unit costs cannot be judged adequately when it is not clear which program(s) were included in the cost data. The following transportation programs are examples of how certain programs may be broken out or included in the cost figures.

Summer School Program
Regular Program
Kindergarten Program
Special Education Program
Vocational-Technical Education Programs
Federal Programs
Extracurricular Programs

The extent and complexity of each program and the number of different transportation program units will depend on pupil-transportation laws and policies relative to pupil transportation accounting requirements in each state.

The comparability of cost variables is made even more complex when there is a lack of agreement on those transportation account variables that are included in total costs. These are listed below as an illustration of another set of factors that muddy the water of transportation cost variable comparability.

Maintenance Costs
Operating Costs
Drivers' Wages
Aides' Wages
Supervisors' Wages
Capital Outlay
Depreciation Costs
Debt Retirement-Principal and Interest Costs
Insurance Costs
Driver Training Costs
Inspection Costs
Licensing Costs

The list is not complete but gives one an idea of why too few standard cost units are comparable between and among states unless efforts are made to standardize and control the variables that influence costs.

Cost Comparison Survey

With the preceding qualifications as an expression of the limitations of cost comparability, it was thought that an attempt should be made to gather cost data from other states for the purpose of making a few generalizations about Delaware's transportation costs relative to other states. The survey included those states which border on Delaware and those states which are participating in National Educational Finance Project studies. A questionnaire, which originated in the office of the Delaware Department of Public Instruction, was distributed and it requested the transportation divisions in each state to report three cost figures: average cost per pupil, average cost per mile, and average cost per pupil per mile. Each state was requested to provide cost data for both public owned and private owned vehicles if such costs were available. In addition, it was requested that the respondent indicate which programs and account variables were included in the cost data.

The information and data returned was rather sporadic and incomplete. Few states kept the necessary records to provide all cost unit data that was requested. Those that replied and supplied cost data did not include an adequate explanation of what programs and account factors were included in the unit cost calculations.

Table 13 represents an attempt to present the cost data that were returned from the states sampled. The footnotes to this table include descriptions of each state's program as they were supplied from each state.

TABLE 5-13

PUPIL TRANSPORTATION COSTS IN SELECTED STATES

State and Data Year	Cost Per Pupil Per Year		Cost Per Mile	
A		$50.04		$.3878
1970-71				.4379
B	$38.33[a]	$47.46[d]	$.419[a]	$.52[d]
1971-72	51.39[b]		.669[b]	
	43.82[c]	51.39[e]	.480[f]	.669[e]
C		63.03[a]		.52[b]
1970-71				
1971-72		57.95[b]		
D		52.25		.273
1971-72				
E		44.85		.22
1971-72				
F		41.28		.29
1971-72				
G		68.62		.644
1971-72	RANGE	52-112	RANGE	.44-.77
H	48.41[a]	RANGE 39-351	.68[a]	RANGE .45-1.62
1969-70	75.60[b]	RANGE 44-200	1.24[b]	RANGE .49-2.71
I		70.18[a]		.65[a]
1970-71		91.40[b]		.90[b]
Delaware		71.89[a]		
1971-72		65.07[b]		
		71.17[c]		

Program and Cost Descriptions to Accompany Table 13.

A. The daily cost per pupil and the cost per pupil are based on 1970-71 figures and include the total cost of operation, including insurance, depreciation of school buses plus maintenance equipment. In this state approximately 92 percent of the buses are district owned and operated.

   a. Public and private owned equipment combined
   b. Cost per mile for regular program
   c. Cost per mile including the regular program, passenger car miles, and activity trips.

B. The costs shown are only for regular program routes. The cost of special trips, federal program transportation, and summer school are not included. Approximately 99 percent of all buses are district owned and operated.

   a. Public owned without capital outlay and replacement costs included
   b. Private owned without capital outlay and replacement costs included
   c. Combined costs without capital outlay and replacement costs included
   d. Public owned with capital outlay and replacement costs included
   e. Private owned with capital outlay and replacement costs included
   f. Combined public and private owned with replacement costs included

C. These costs include vehicle purchases. It is not known whether the costs are for regular programs alone or whether other program costs are included. Approximately 30 percent of the buses are publicly owned in this state.

   a. Cost for 1971-72
   b. Cost for 1970-71

D. The costs shown are only those costs approved by a state formula and paid by the state. Local districts may have to supplement these amounts. The costs shown are for the regular transportation program only. Roughly 98 percent of the buses in this state are publicly owned.

E. The pupil transportation cost per pupil includes the bus purchase price and the drivers' pay. What other costs are included is not known. The cost per mile does not include drivers' pay. Over 90 percent of the buses in this state are owned by the school districts.

F. The data for this state include all transportation costs with the exception of bus depreciation and purchase costs. Nearly all buses in this state are publicly owned.

G. This state almost totally supports the transportation costs of local districts. The costs shown include the cost of new equipment, capital facilities, handicapped transportation and nonpublic transportation. Roughly 43 percent of the buses are publicly owned.

H. The costs for this state include all transportation costs including capital outlay and a $.07 per mile depreciation factor for district owned buses. Approximately 33 percent of the buses are publicly owned. Deadhead mileage was not included in the mileage calculations. The 1969-70 figures make comparisons with other states difficult.

   a. Denotes cost on district owned equipment
   b. Denotes costs on contract equipment

I. Costs include all pupils transported--handicapped, elementary, secondary, those approved who live less than 1.5 miles from school, and extra-curricular trip costs. One of the state's metropolitan school district costs were not included in the costs. Also, the costs do not include bus purchases or debt services. Approximately 53 percent of the state's vehicles are publicly owned.

   a. Denotes costs related to public-owned vehicles
   b. Denotes costs related to private-owned vehicles

Delaware-Costs include all pupils transported--handicapped, vocational-technical, regular, and special. Contract and public owned vehicle costs are included. All costs on leasing, capital outlay, depreciation, and investment allowances on contract vehicles, insurance, administration, operation, and maintenance drivers' salaries, bus storage and physical exams are included. Costs for extra-curricular trips are not included and are borne by local districts. An extended explanation of the program was included earlier in the report.

   a. Denotes costs for public transportation including contracted services
   b. Denotes costs for nonpublic transportation
   c. Denotes the combined costs for public and nonpublic transportation

Any conclusions from the comparisons of the data presented in Table 13 would have to be very general. Comparisons between states virtually are impossible due to the lack of a standardized method of cost accounting for transportation programs. For example, it would appear that Delaware's average per pupil costs are in excess of those in other states. Except for one or two states, however, the average per pupil costs are not comparable to Delaware's because most states do not include capital outlay, bus depreciation, administration, or insurance in their cost figures. One or more of these variables and perhaps a program cost, such as for special education, are not included. The transportation programs in States G and H appear to be the only programs in which the costs may be comparable, but State H costs were available only for 1969-70 and thus are not comparable with 1971-72 costs. State G's program is similar to Delaware's and its costs also appear to be similar with those in Delaware.

The one conclusion that may be drawn from these data is that the costs of school district owned and operated vehicles appear to be less than the costs incurred through contracting for privately owned vehicles. However, one must qualify such a statement; many of the standard cost variables (average cost per pupil or per mile) do not include purchase costs, depreciation or any profit figure for district owned vehicles. The fact that school districts are exempt from many costs (taxes, licenses, insurance, etc.) which private contractors incur, may add 5 to 10 percent to total costs. It is probable that if taxes and other costs incurred by the state were added to district-owned equipment costs, the standard costs for privately-owned equipment would be very similar to those of the local district. The question remains though of whether the extra costs for profit, taxes, etc., created by the endorsement of a private enterprise policy, are an advantage to the state.

Other Cost Relationships

There are other cost relationships that have been reported in studies of transportation systems in addition to the public versus private ownership comparison. Generally, it is well known that school districts in heavily populated areas incur higher costs because wage scales are higher, fringe benefits are more expensive, capital outlay facilities cost more, and the operational problems of routing, traffic congestion, and traffic hazards tend to drive per pupil costs higher than in suburban and rural areas.

A cost relationship that has been researched to some degree is the relationship between density of the transported student population and transportation costs per pupil. Most studies indicate that an inverse relationship exists between density and costs per pupil, i.e., the greater the density the lower the cost per pupil. Conversely, a greater density usually results in higher costs per mile relative to low density patterns.

The data reported in Table 14 illustrate the relationships between average cost per pupil and the density of the transported student population of the school districts in Delaware. Generally, higher per pupil costs are associated with a lesser number of students per square mile. There are exceptions to this and it is important to note the

TABLE 5-14

RELATIONSHIP BETWEEN TRANSPORTED PUPILS PER SQUARE MILE AND COST PER PUPIL 1971-72

District	Cost Per Pupil	Rank	Transported Pupils Per Square Mile	Rank
Alexis I. duPont	$ 76.57	11	81.8	10
Alfred I. duPont	83.37	5	274.2	5
Appoquinimink	100.54	1	12.3	22
Claymont	42.78	22	92.7	8
Conrad	21.80	23	445.5	1
De La Warr	75.79	13	282.1	4
Marshallton-McKean	66.02	18	339.7	2
Mount Pleasant	50.75	21	337.8	3
New Castle G.B.	62.84	20	90.6	9
Newark	71.48	16	172.0	7
Stanton	81.26	6	171.8	6
Wilmington	80.00*	7	73.9	11
Caesar Rodney	62.98	19	42.2	13
Capital	67.21	17	43.8	12
Lake Forest	73.49	15	16.9	17
Milford	75.15	14	20.2	15
Smyrna	80.81	8	11.9	23
Cape Henlopen	83.54	4	15.8	19
Delmar	83.74	3	15.9	18
Indian River	76.26	12	17.6	16
Laurel	77.50	9	13.7	20
Seaford	77.05	10	35.1	14
Woodbridge	86.37	2	12.5	21

Note: The cost per pupil includes contracted and district operations for regular and special students. The table does not include costs on vocational-technical students transported.

Statistical Relationship: The Pearson Product Moment Correlation was -.46 and was significant at the .025 level. However, a number of studies have shown that the relationship between transportation costs and density is currilinear, therefore, the Pearson Correlation understates the actual correlation because the Pearson Correlation assumes that the correlation is linear.

* Excludes the New Castle vocational-technical school.

exceptions and be able to explain them. There are unique transportation problems associated with some districts, i.e., high labor costs, more special education students being transported, more special hazard ridership and more traffic congestion should help explain why the costs are not perfectly correlated with density. The value of comparisons of this nature is that school district and the state officials should be able to explain adequately the exceptions and the unique condition that affect this relationship; if they cannot, they should probe for the circumstances that are causing the apparent inefficiency of the operation.

A more adequate measure of the efficiency of a transportation program is the relationship between pupil lineal density and per pupil costs. Pupil lineal density is defined as the number of children per mile of bus route. Aggregations of costs and density factors can be determined for one route, several routes by program, one school district, one transportation district, one county, or one state. An inverse relationship between pupil lineal density and per pupil costs is the customary finding of research on this comparison. If a study of the state transportation system should find that this relationship is weak, there may be reason to suspect that a few districts or routes are not operating efficiently. The important consideration is the same as the one mentioned above--that local and state transportation officials should probe for the weak relationships between lineal density and per pupil costs and then be able to explain the conditions that affect the relationships.

The comparison of pupil lineal density with per pupil costs is not a perfect measure but it is one of the better predictors of efficiency. The measure can say little about the efficiency of route patterns, deadhead miles or the dispersion of pupils. The measure's value lies in its use as a comparison to be used within a given district or state to compare a route or set of routes under the normative operations of a district or state transportation program.

CONCLUSIONS AND RECOMMENDATIONS

The final section of this report will combine the findings and discussion presented heretofore with some judgments and commentaries on the state transportation program in Delaware. Conclusions and recommendations regarding a transportation program are at best tenuous and temporary judgments of an existing pattern of operation. Nonetheless, there are a few conclusions and recommendations which can be made that may facilitate desirable changes in the transportation program. It is with the thought of enhancing future program directions that the following comments and suggestions are advanced.

The State Formula and Allocating Transportation Aid

The total dimension of costs and an equitable means of distributing state transportation dollars hardly can be considered without treating the question of the economic efficiency of a program. There can be no question that it is less costly for a school district or a state to operate equipment that is owned either by the school district or the state. Repeated studies and research have corroborated this fact and this study's cursory look at a comparison of two cost variables would seem to substantiate that conclusion. Leaving this conclusion as it stands, however, is not sufficient; there is need for more in depth analysis of the program under consideration in this report.

Accepting the existing transportation formula as a viable means of allocating Delaware's transportation dollars will serve as a starting point. What differences are there between the variables and the reimbursement received by districts that own their equipment versus the variables and the reimbursement received for private contract operations? Allowances for depreciation costs and interest on the investment provided private contractors is one variable which may contribute to cost differences. Through purchase, lease-rental, and lease-purchase arrangements the school district and/or state has the opportunity to reduce capital costs by purchasing buses outright or reducing the indebtedness costs by abbreviating the period of the lease or purchase arrangement. The depreciation and interest on investment allowances in Delaware for contract operations seem reasonable as they cover the bus purchase costs for ten years and interest costs for roughly a five year period. Those contractors who have adequate capital to finance the outright purchase of a bus, however, are at a distinct advantage, and the return on their investment is greater than those contractors in a less favorable capital position. Nevertheless, some savings could result if the state or local school districts assumed a greater role in purchasing buses and in reducing the indebtedness period.

The other differences between public versus private ownership rest with costs for fixed charges, operating allowances, and administrative allowances. Bus licenses and insurance costs are assumed by the state for public owned equipment while private contractors are reimbursed for these costs. Assuredly, these two fixed-cost variables contribute to a cost differential, but, the question may be raised as to who assumes the cost of a license if the private contractors were not in the picture. It might be reasonable to expect that a realistic cost comparison between private and public ownership would include an imputed cost for public ownership for these two variables. Few states or school districts impute such costs and this is one reason the comparisons between the private and public ownership of vehicles is not realistic. As both license and insurance costs are assumed by the state for both private and public owned vehicles, the burden of these costs rests on the taxpayers in Delaware. The question of whether license and insurance costs would be less under a public ownership system is unanswered. The state likely is in a more favorable cost position when it can provide insurance coverage under an umbrella plan or can bid a total coverage plan on a statewide basis. The difference in costs for licenses and insurance between public and private ownership plans, however, is likely to be small.

The operation allowances provided by the state for public and private owned vehicles is different. The differences are inherent in the state formula which provides for workmen's compensation, unemployment insurance and Social Security allowances for private contractors and not for district owned operations. These additional costs for private operations roughly add five percent to the per diem operation allowances over district operation costs. More reliance on district or state owned vehicles, admittedly, would reduce the overall operation costs and the standard unit costs.

The administrative allowance provided in the formula roughly is 10 percent of the per diem allowance for depreciation, fixed charges and operation. As there is no depreciation allowance for public owned vehicles the administrative allowance for schools is based on 10 percent of the fixed charges and operation costs. The administrative allowance, then, is less for public owned vehicles because there is no depreciation allowance included in the base cost and because the per diem fixed charges and operational allowances are less for district operations. It should be noted that the 10 percent administrative allowance is based only on per diem costs south of the canal. Equity considerations would dictate that if the 10 percent allowance is reasonable it should be based on costs regardless of the geographic location of an operation. The state might consider basing the 10 percent administrative allowance only on fixed charges and operating costs for contract operations. Such a change would result in a per diem rate reduction of roughly $.70 to $.80.

Another argument is the one relating to adequacy and serving the needs of a clientele. The most apparent absence in the reimbursement formula is an allowance for district educational or enrichment trips. Most authorities agree that for a state transportation program to be adequate it should include some provision for partially reimbursing districts for costs incurred in legitimate educational program enrichment trips. The reimbursement allowances should be such that the least wealthy districts are not deterred from offering such trips because of their financial status.

Other arguments for public ownership include the closer supervision of personnel, greater control, and more flexible use of equipment. The arguments for private ownership contend that it is more consistent with a free enterprise philosophy, that it will reduce local district adminimstrative problems, that better maintenance of buses will result because of greater owner interest, and that capital investment costs are too burdensome for school districts.

There are several options available to Delaware if it wishes to reduce the cost of its transportation program. The following alternatives are not necessarily in order of priority but only suggested approaches after the philosophy and the policies related to the transportation program have been established.

1. If the state policy supports the concept of a complete public ownership of buses, the state could establish a planned bus-purchase program that would replace all contract equipment as it became obsolete with state-district jointly owned buses.

2. If the state policy is one of continued reliance on private contracts, the state might consider changing its statutes and policies and serve as an intermediate leasing agency. The state could purchase the buses and then lease them to private contractors to operate. The state in a sense would act as a financier and charge to contractor the state's purchase cost over the period of the lease. A large part of the difference between public and private cost is attributable to the investment reimbursement provided contractors. For example, a $9,000 bus over a ten year period costs $13,950. Substantial savings could result if the state purchased the buses outright and then leased them back to private contractors.

3. If the policy implies continued reliance on private sector contracts but with some local leeway, it is suggested that the state set a minimum percentage or number of buses (for example, 10-15 buses or 10 percent, whichever is greater) that will be state and/or district owned in each Transportation Supervisor's district. The implementation of the recommendation will provide school districts with a fleet of buses to use for educational and extracurricular trips and at the same time should reduce state reimbursement cost and local district costs. It is suggested that a minimum fleet size be established such that efficiency of operation, maintenance and facilities will be maintained.

4. If the policy suggests equal reliance on public and private ownership, a plan could be implemented whereby obsolete contract equipment would be replaced by public owned equipment until the proper balance is achieved. Any of these recommendations which suggest a change in the reliance on public and private equipment should be planned and implemented with some regard for the private contractor. Major and abrupt changes that affect the private contractors' livelihood or profit should be avoided. The state's policy implementation plan should have the concern of those affected in mind and then move gradually and deliberately to a selected target date for completion.

5. With respect to recommendations for specific formula changes, the following are suggested for consideration:

   A. The state should apply the 10 percent administrative allowance to both south and north of the canal. Equity considerations would dictate that this is a fairer method of calculating this formula variable.

   B. If the state is looking for a means of trimming the reimbursement allowances, it is suggested that the 10 percent administrative allowance be applied only to fixed charges and operations and not to the investment allowances.

   C. It is suggested that some provision be made by the state for reimbursing school districts for educational related trips. A reasonable program cost could be estimated with the state supporting the minimum program based on a sliding, school district wealth scale.

   D. The State Transportation Division should make a survey of the value of a bus when it is retired from service at the end of 10 years or 95,000 miles. This cost value should then be subtracted from the purchase cost of the bus before reimbursement allowances are made for depreciation and investment costs.

E. Assuming it is legal or can be made legal, the state should consider making bus transportation insurance available to private contractors. The state, acting as an intermediate agency, could accept bids in the interest of the contractor and then make the insurance available through the state or directly from the insurance company. The formula would then be changed to reflect the actual costs incurred through the insurance bids accepted by the state. A voluntary participation plan, assuming the bids received by the state were lower, would compel private contractors to select the best, lowest-cost coverage or lose money.

F. The Transportation Division of the Department of Public Instruction should be constantly studying and adjusting formula variable allowances so they are current with existing policies and geographic differentials in prices. It is suggested that District Transportation Supervisors be given the responsibility of making spot surveys of local prices and costs associated with wages, maintenance, and operation immediately prior to the approval of the reimbursement formula for the ensuing year.

The above suggestions and recommendations for changes in the allocation system do not reflect unfavorably on the value of the formula approach used in Delaware. Actually, Delaware has one of the best formulas and transportation programs in existence in any state. The existing formula is one of the fairest and objectively conceived methods of distributing state transportation dollars to local school districts that this writer has studied. Delaware is rather unique in that it is small in area and population. The opportunity exists in Delaware to give such programs as the transportation of school children very individualized and personalized attention.

Allocating District Supervisors

The present method of allocating district transportation supervisors in the state is based on one supervisor for each 7,000 pupils transported. This allocation system does not allow for an arrangement wherein a supervisor will fit neatly in one school district or within existing boundaries of more than one school district; there likely is no arrangement which will be completely equitable and operationally functional at the same time.

The question is whether basing the allocation on transported pupils is the best, in terms of operation, equity and function, that is available. The main advantage of the present method is its simplicity. It is fairly uncomplicated to determine where the pupils reside and include those school districts in a region that comes closest to 7,000 pupil population size. To solve the problem of determining a better system of allocating district transportation supervisors would take more in-depth data and analysis than this study can provide. Planning a more complex yet more equitable and functional allocation system should include some of the following considerations.

1. The number of pupils transported is not necessarily the most accurate predictor of the burden of responsibility on a district transportation supervisor. It would seem that a better system of allocating supervisors in the state would be one in which one or more of the following variables is included.
    a. The number of buses operating in a district and the distribution of those buses between public and contract operations.
    b. The number and complexity of the bus routes that must be planned.

  c. The time that must be devoted to special transportation problems, i.e., unique hazards, traffic congestion, securing and holding competent employees, employee training, gathering and compiling data, etc.

2. It is recommended that if the policy is changed regarding the allocation of district transportation supervisors that the state take cognizance of the above factors and undertake a study to determine the relationship between these factors and the burden of responsibility on supervisors. An analysis of the burden on the existing supervisors may be able to determine which of these factors are the best predictors of responsibility load.

Pupil Mileage Limitations

To qualify for transportation reimbursement from the state, a school district transports a student in grades 1-6 who lives more than one mile from school and a student in grades 7-12 who lives more than two miles from school. A special state committee on traffic hazards decides which students who live less than the stipulated miles from school qualify for transportation. The trend in many states over the past few years has been to reduce the mileage limitations, thus qualifying more students for transportation and school districts for more state reimbursement. The whole question of qualifying mileage limitations is a matter of opinion. There likely is no research which will indicate that a child's educational performance or attitudes are thwarted because he or she had to walk to school. The real question is to what extent the state wants to provide its citizens and pupils with the service. The trend has been in the direction of lowered mileage limitations for younger pupils but this change has resulted in higher transportation costs.

1. If the state should decide to expand its transportation services by reducing mileage limitations, the following system is recommended.
    a. Provide transportation for those in grades K-3 who live further than .7 miles from school.
    b. Provide transportation for those in grades 4-6 who live further than one mile from school.
    c. Provide transportation for those in grades 7-12 who live further than two miles from school.

Provisions for Cost Data and Comparisons

The inadequacies of unit cost data and the lack of comparability of transportation programs on the basis of costs were noted earlier in this report. Nonetheless, each state should make an effort to generate cost data if only for within-state comparisons. It is recognized that gathering cost data and completing state reports related to these data is a time-consuming and costly process. The benefits of the data gathering and data compiling process hopefully will exceed its time and cost outlays. The products of the process -- comparable cost data -- should provide officials of the state with better information and data with which to make decisions. The results of more rational decisions are well known -- a better structured state transportation system which is more economically efficient and effective in serving the citizens of the state.

After examining transportation data availability and use in Delaware, the following suggestions are made for the consideration of state officials.

1. The Transportation Division of the Department of Public Instruction should consider generating cost per pupil data for the following programs, levels, and functional categories.

    a. Levels - State, County, Transportation District, and School District.

    b. Programs - Regular, Special, Vocational-Technical, Summer School and others as deemed necessary.

    c. Categories - Public children, Nonpublic children, Public owned equipment, Private owned equipment.

    d. Combinations of the cost units above which it is believed will add an important dimension to the decision-making process regarding transportation programs.

2. The state should consider generating figures on the lineal density per bus mile, which when compared with costs per pupil will give some indication of the economic efficiency of a given level, program or category of operation. This comparison within a school district or transportation district on a route basis is the best indicator devised to give insight into the efficiency of an operation. Cost exceptions can be noted in which there is not a strong negative relationship and hopefully the exception can be explained or changed to reflect a more normal negative relationship.

3. All transporation costs are real costs and should be included in unit cost data. Depreciation costs, capital outlay, salaries, maintenance, operation, and insurance are considered factors which influence transportation cost data. As public and private operations are compared on a cost basis, officials should consider imputing some costs to public operations that are otherwise not attributed to public owned vehicles; insurance and bus licenses are two examples of costs that are incurred by state taxpayers but generally are absent from the cost data for public owned equipment.

4. If the three recommendations above are implemented (along with some other recommendations), it will be necessary for the Transportation Division of the Department of Public Instruction to secure some additional assistance in that office. There are at least two ways this might be accomplished. An individual from the Research Division of the Department of Public Instruction could be assigned to the Transportation Division on a time-allotment basis which would allow for generating the necessary data. The other alternative is to recreate the position of Assistant Supervisor of Transportation and give him the responsibility of gathering, compiling, and analyzing the data that are needed relative to the transportation program.

Driver Training and Safety Records

These two topics are presented together because they are closely related. The present bus driver training system requires that a valid bus driver's license be given only to those individuals who have completed an eight hour training session. After examining the materials and information covered in the training session, one would question whether adequate coverage of all the subjects can be accomplished in the eight hour period, therefore, the following is recommended.

1. The State Pupil Transportation Division office should evaluate the materials and information it believes are necessary for an adequate training course and then set a reasonable training period length of time in which the course material may be covered. The present training manual, it is estimated, would take a minimum of two full days to cover.

2. State officials should consider the establishment of updating or retraining sessions for those individuals who continue to be employed as bus drivers for over two years. State laws and transportation policies will be revised and new laws and policies will be added and drivers need to be made aware of these plus any additional information that has been generated since their first course. It is suggested that all bus drivers be required to take a four hour refresher course every other year before their driver's license is validated, i.e., third year, fifth year, seventh year, etc.

3. The safety records kep on pupil transportation in the state could be more comprehensive. Presently, accident records are compiled on the basis of police reports completed at the scene of an accident. In addition to the present system, it is recommended that the district transportation supervisors be asked to complete accident report forms along with the appropriate driver personnel variables. A summary report, originating from each transportation district, should be made to the State Pupil Transportation Division each year. Local accident reports will assist state officials in compiling information on the relationships between various factors such as age, sex, experience, driving conditions, time, location, etc., with accident frequency and severity.

In conclusion, it should be noted that Delaware has one of the most adequate state transportation programs in the United States. The conclusions and recommendations contained in this report should be challenged and debated by state and local policymakers and administrators. Only after serious deliberation and appropriate evaluation should any of these recommendations be implemented.

FOOTNOTES

1. Research Division of the National Education Association. RANKINGS OF THE STATES, 1972. Washington, D.C.: The Association, 1972, p. 51.

2. Delaware Department of Public Instruction. HISTORY OF EDUCATION IN DELAWARE. Dover, Delaware: The Department, June, 1969, p. 28.

3. *Ibid.*, pp. 56-57.

4. Presently the Department of Public Instruction does not employ an assistant supervisor of transportation.

5. Simpson and Curtin. STUDY OF SCHOOL BUS TRANSPORTATION IN NORTHERN DELAWARE, PHASE I. Prepared for the Delaware Department of Public Instruction. Philadelphia, Pa.: Simpson and Curtin, April, 1972, p. iii.

6. The substance of this program description was taken from Leon M. Hart. "Transportation Reimbursement Formula for Public School Districts Operating District or Lease-Purchase Buses." Dover, Delaware: Delaware Department of Public Instruction, April 5, 1972. Mimeographed.

7. The substance of this program description was taken from Leon M. Hart. "Formula Number Two for School Bus Contracts, 1972-73." Dover, Delaware: Delaware Department of Public Instruction, January 3, 1972. Mimeographed.

SECTION 6

SCHOOL FOOD SERVICE PROGRAMS IN THE STATE OF DELAWARE

William H. Castine
Florida A & M University

This report deals with school feeding programs as one aspect of the overall system of education. In collecting data and developing the report, the Department of Public Instruction and the individual school districts have been relied upon and have given excellent cooperation. The time and effort of personnel in these agencies are sincerely appreciated.

LEGAL BASIS FOR SCHOOL FOOD SERVICE PROGRAM

The legal framework underlying school food service programs in Delaware seems adequate. Although detailed information was not available prior to this writing, one can glean considerable information from the Delaware State Plan of Child Nutrition Program Operation for Fiscal Year 1973 (dated December, 1971) and other information provided by the Department of Public Instruction.

Authorization for administration of school food service programs is granted in a statute vesting administrative and supervisory authority for all public education programs in the State Board of Education. State public funds may not be used for grants-in-aid to non-public institutions; thus, no tax monies are used to provide material to such institutions. In the absence of prohibiting legislation, the state of Delaware does administer child nutrition programs in nonpublic institutions. Such an arrangement exists in numerous states and appears advantageous in terms of providing services to all children within the state.

State law provides for the payment of salaries to School Lunch Supervisors and Cafeteria Managers in local school districts. This practice is commendable, as it presumably provides necessary personnel to the districts to support the overall program. The establishment of qualifications for these positions by the State Board of Education is viewed as an effort not only to standardize personnel, but also to encourage such employees to improve their qualifications.

Procedures for disbursing federal and state monies to local child nutrition programs appear to be quite adequate. All records are kept by the Department of Public Instruction which forwards invoices to the State Treasurer for direct payment to local districts. This approach appears to work effectively, yet avoids unnecessary paper transactions. The consolidation of all claims (e.g., breakfast, lunch, special milk) into one claim per district per month appears to be most expeditious.

The State Purchasing Agent is responsible for the allocation and distribution of federally-donated commodities. Although this practice is not necessarily undesirable (and may be a very logical arrangement), it requires close cooperation between two agencies within the state government. If the purchasing agent must be involved, two alternatives should be considered as an approach to centralizing school food service program functions. One alternative would be to transfer authority and responsibility for allocation and distribution of commodities to the State Director of School Food Services; the other apparent choice would be to place the allocation function in the Department of Public Instruction and let the distribution function remain with the Purchasing Agent. This latter approach seems analogous to the procedures for reimbursement, with the Department of Public Instruction transmitting invoices for payment to the State Treasurer. The main point here is that school food service program personnel would be expected to be trained and have experience in utilization of foodstuffs, while purchasing department personnel would not necessarily have this background.

Few constraints are placed upon the utilization of funds for child nutrition programs. As pointed out earlier, public monies may not be used to provide grants-in-aid to nonpublic institutions. Other constraints appear to be only those related to the funding of personnel (number and qualifications).

The relationship of the School Food Service Program to other administrative and supervisory units within the Department of Public Instruction appears equitable. The present arrangement requires the establishment of effective working relationships among persons with a wide variety of responsibilities (e.g., home economics, health services, and school food service personnel in addition to curriculum supervisors and classroom teachers). Nonetheless, the primary focus of child nutrition programs is upon the provision of nourishment and this function appears to be feasibly located within the administrative structure of the Department of Public Instruction.

The qualifications of school food service supervisors and school lunch managers are set forth in state statutes and are designed to assure the employment of well-qualified persons. In addition to initial qualifications, all school food service personnel participate in in-service education programs designed to upgrade continually their knowledge and skills. The organization of in-service programs appears to be quite effective and should lead to continued improvement in program personnel. Coordination and articulation from the state level through the school districts to local school personnel seems well-planned and effectively designed.

FINANCING THE SCHOOL FOOD SERVICE PROGRAM

The state of Delaware administers five child nutrition programs for public schools and three programs for private schools. Expenditures of federal funds for these programs are summarized in Table 1, based upon the 1971-72 year.

Inasmuch as state funds were earmarked for administration and supervision which included all programs in both public and private institutions, no breakdown by program was made. Of the $1,188,269 expended from state sources, $26,397 was used at the state level and $1,161,872 was distributed among local schools and school districts. These figures do not include capital outlay for facilities and equipment nor local funds expended for any phase of the program.

TABLE 6-1

FEDERAL FUNDS FOR SCHOOL FOOD SERVICE PROGRAM, 1971-72
(Does not include estimated value of surplus commodities furnished)*

Program	Private Schools	Public Schools	Total
From Federal Funds			
Lunch	$ 6,342	$ 1,790,201	$ 1,796,543
Breakfast	0	83,948	83,948
Special Milk	26,182	264,579	290,761
Non-Food Assistance	0	39,446	39,446
SFSPC (Day Care)	0	130,348	130,348
TOTAL From Federal Funds	$ 32,524	$ 2,308,522	$ 2,341,046

Source: State Board of Education and Department of Public Instruction. Report of Educational Statistics, 1971-72.

*Estimated value of surplus commodities furnished $1,695,088.

Table 2 shows that the income of the National School Lunch Program totalled $8,580,504 in 1972. Income from children provided $3,644,058 or 42.5 percent of the total school lunch cash income. The percent of participation in the school lunch program depends largely upon the price of the school lunch charged children, the quality of the food served and the adequacy of physical facilities. Studies of the National Educational Finance Project in 1968-69 showed that income from children comprised approximately 50 percent of the school lunch income for the nation.[1] During that same year approximately 37 percent of the children of the nation participated in the National School Lunch Program.[2] Table 4 shows that

TABLE 6-2

NATIONAL SCHOOL LUNCH INCOME, 1971-72

Source of Income	Amount	Percent
Children	$ 3,644,058	42.5
Federal	2,177,832*	25.4
State	1,161,872	13.5
Other	1,596,742	18.6
TOTAL	$ 8,580,504	100.0

* Does not include value of surplus commodities furnished.

Source: Adapted from the Report of Educational Statistics, 1971-72. State Board of Education and Department of Public Instruction.

an average of 59 percent of the school enrollment in Delaware participated in the school lunch program in Delaware in 1970-71. Therefore, Delaware's school food service policies have resulted in a higher percent of participation in the school lunch program than the national average.

Table 3 shows the distribution of expenditures for the school lunch program. Over 92 percent of the total expenditures for the school lunch program are allocated to food and labor. Thirty-nine percent of total expenditures or $3,155,663 were required to meet labor costs of the school lunch program in 1971-72. It is noted from Table 2 that the state provided $1,161,872 in 1971-72 toward meeting the cost of school lunch managers and supervisors. For an additional $2,000,000 the state could have met the total labor costs of the school lunch program. This would have resulted in a decrease of approximately 20 percent in the price of the school lunch charged to children and would no doubt have further increased participation in the school lunch program. Authorities on the financing of the school lunch program have recommended for many years that at least the total labor cost of the school lunch program be paid from public funds so that children would be charged, at most, only the food cost of the program. If the state provides the full labor cost of the program from state funds and federal funds are applied principally to food costs, then boards of education would be able to set the price of the school lunch program to pupils, equal to or less than the food cost. This should result in still further participation in the school food service program.

TABLE 6-3

NATIONAL SCHOOL LUNCH PROGRAM EXPENDITURES, 1971-72

Purpose	Amount	Percent
Food	$ 4,328,934	53.4
Labor	3,155,663	39.0
All Other	617,260	7.6
TOTAL	$ 8,101,857	100.0

Source: Adapted from the Report of Educational Statistics, 1971-72. State Board of Education and Department of Public Instruction.

Local tax support for the school food service program is almost nonexistent. Only five school districts reported any income from tax sources and the amount of such funds was extremely small in relation to the cash flow in the program. Many districts did, however, report various aspects of the program to be supported by the school board and not charged against school food service. For example, utilities often were in this category, as were facilities, equipment, clerical assistance, and sundry other items.

PARTICIPATION IN SCHOOL FOOD SERVICE PROGRAM BY DISTRICT

All public schools in Delaware participate in the National School Lunch Program (NSLP). This is a commendable achievement in attempting to provide adequate nutrition to all children. In accord with federal regulations, NSLP schools must offer meals to economically needy students either free or at a reduced price, contingent upon the level of family income and family size. The state of Delaware has provided all school districts with instructions for complying with the regulations and samples of necessary documents. The state, by so doing, has fulfilled its obligation with respect to policies and procedures for offering free and reduced-price lunches. Similar steps have been taken with respect to breakfasts for economically needy students. Each school district has complied with the regulations in a manner which appears satisfactory; thus, no further review of the policies and procedures is deemed necessary.

The Delaware State Plan of Child Nutrition Program Operation for Fiscal Year 1973 appears to be quite comprehensive, sound, and feasible. The program goals and proposed means of achieving those goals are realistic, yet will require expansion and improvement of existing programs.

Statistical data and relevant information were solicited from the State School Food Service Supervisor and from each school district. The return was exceptional. Only one school district failed to respond to requests for information. Omission of this district having one school and an average daily attendance of 1,240 students should have no appreciable effect upon the overall study of child nutrition programs.

A general profile of the major two public school food service programs is given below, summarized by county and district in Table 4. The profile is based upon data provided by the various school districts especially for this study.

Average daily participation in the National School Lunch Program ranged from forty percent in one district to more than eighty percent in another excluding vocational-technical schools. The state average was fifty-nine percent. The percentage of lunches served free or at a reduced price varied from one percent to sixty-nine percent; the state average was a little over twenty-three percent.

Breakfast was available to less than one-fourth of the school children in the state during 1971-72; yet only a little over one-tenth of these children participated in the program. Although the breakfast program probably is not needed in every school, expansion appears to be in order. The Delaware State Plan recognizes this. At the same time, probably more students should be encouraged to take advantage of the program where it is available at present.

TABLE 6-4

PUBLIC SCHOOL FOOD SERVICE PROGRAMS

School District	Lunch Program						Breakfast Program		
	Lunch Schools	Average Daily Attendance (ADA)	Average Daily Partici-pation Total (ADP)	Per-cent	Number of Free and Reduced Price	Per-cent (ADP)	Break-fast Schools	ADA	ADP
Kent County	36	23,595	14,020	60	3,421	24	8	3,671	545
Caesar Rodney	10	7,430	4,005	54	658	16	0	0	0
Capital	9	6,210	3,687	59	677	18	3	1,478	147
Kent County Voc-Tech	1	450	236	52	38	16	0	0	0
Lake Forest	5	3,266	1,917	59	506	26	0	0	0
Milford	6	3,574	2,425	68	1,164	48	5	2,193	398
Smyrna	5	2,665	1,750	66	378	22	0	0	0
New Castle County	117	77,294	43,562	56	9,840	23	32	22,021	2,545
Alexis I. duPont	7	2,655	1,263	48	95	8	0	0	0
Alfred I. duPont	14	10,496	4,178	40	36*	1	0	0	0
Appoquinimink	4	2,024	1,360	67	300	22	0	0	0
Claymont	5	3,424	1,541*	45	180	12	1	-	-

TABLE 6-4 (Continued)

School District	Lunch Program						Breakfast Program		
	Lunch Schools	Average Daily Attendance (ADA)	Average Daily Partici-pation Total (ADP)	Per-cent	Number of Free and Reduced Price	Per-cent (ACP)	Break-fast Schools	ADA	ADP
Conrad	6	6,171	3,456*	56	322	9	6	6,171	178
De La Warr	6	3,306	2,431	73	592	24	5	2,506	349
Marshallton-McKean	6	4,273	1,865*	44	1,063	57	0	0	0
Mount Pleasant	7	4,978	2,429	49	133	5	1	1,798	-
Newark	20	13,520	7,126	53	340	5	1	124	27
New Castle-Gunning Bed.	12	8,114	5,624	69	370	7	0	0	0
Stanton	9	5,223	3,179	61	69	2	0	0	0
Wilmington	21	13,110	9,110	70	6,340	69	18	11,422	1,991

TABLE 6-4 (Continued)

School District	Lunch Program						Breakfast Program		
	Lunch Schools	Average Daily Attendance (ADA)	Average Daily Partici-pation Total (ADP)	Per-cent	Number of Free and Reduced Price	Per-cent (ADP)	Break-fast Schools	ADA	ADP
Sussex County	30	18,171	12,808	70	3,157	25	0	0	0
Cape Henlopen	7	3,368	2,768	82	851	31	0	0	0
Delmar	1	650	460	71	21	5	0	0	0
Indian River	9	5,547	4,100	74	905	22	0	0	0
Laurel	3	2,111	1,494	71	423	28	0	0	0
Seaford	6	3,446	2,333	68	608	26	0	0	0
Sussex Voc-Tech	1	981	108	11	16	15	0	0	0
Woodbridge	3	2,068	1,545	75	333	22	0	0	0
TOTAL	183	119,060	70,390	59	16,418	23	40	25,692	3,090

*Calculated from other data.

Per Meal Costs of School Lunch Program

The attempt was made to analyze the per meal costs of food and labor in all the school districts of Delaware. Questionnaires were sent to each school district for this purpose. However, the returns indicated that the districts varied so widely in their accounting practices that the data were unreliable. For example, some districts included the salaries of school lunch supervisors in labor costs and some did not. Also, some districts included the value of surplus commodities in food costs and others did not. In addition, the costs of the breakfast program were sometimes included in the costs of the school lunch program. The need for a more reliable management information system for the school lunch program is evident. It is understood that plans are already underway for the improvement of the school lunch accounting system.

The price charged children who pay for their lunches does not vary widely in Delaware. The state supervisor of the school lunch program reported that elementary children were charged from 30¢ to 35¢ per meal with an average charge of a little over 30¢ and high school children from 30¢ to 40¢ with an average of 35¢. This is somewhat less than the price per meal charged school pupils in most states. This lower cost is due principally to the policy of Delaware of paying from state funds the salaries of local school lunch managers and lunch supervisors. The cost to pupils for the lunch will increase if inflation of food and labor costs continues. Informed economists predict that inflation will continue in the foreseeable future. Every measure possible should be taken to hold the costs of the school lunch down by improving the efficiency of management wherever possible. The survey staff did not have the resources available to evaluate the efficiency of school lunch management therefore, it is possible that but little money could be saved by improving management. The surest way to prevent the increase in the price charged pupils for the school lunch is for the state to pay for all approved labor costs of the school lunch program.

SUMMARY

The state of Delaware is firmly committed to the notion that school food service is important, as evidenced by the fact that all public schools in the state participate in the National School Lunch Program. The availability of breakfast in the public schools and both breakfast and lunch in private schools is limited at present. This is acknowledged in the Delaware State Plan of Child Nutrition Program Operation for Fiscal Year 1973. The state should strive to accomplish its goals as set forth in the Plan and to exceed them. As contributions to such efforts, the following recommendations are offered:

1. Seek to improve the information systems presently utilized both at the state and local school district level.
2. Seek new means of encouraging school districts to increase participation in present programs and to adopt programs not presently offered. This applies also to private schools.

3. Transfer responsibility and authority for allocation (or both allocation and distribution) of federally-donated commodities from the State Purchasing Agent to the State Supervisor of School Food Services.
4. Investigate the feasibility and consider the possibility of consolidating the purchasing function of two or more school districts within geographic regions so as to reduce costs.
5. Provide for the full approved labor costs of the school food service program from state funds or a combination of state and local tax revenues.

FOOTNOTES

1. Roe L. Johns, Kern Alexander and K. Forbis Jordan, Planning to Finance Education (Gainesville, Fla:) National Educational Finance Project, 1971, p. 290.

2. Ibid., p. 295.

SECTION 7

VARIABLES ASSOCIATED WITH LOCAL SCHOOL DISTRICT PRODUCTIVITY IN DELAWARE

Scott N. Rose
Director of Budgets and Staff Development
Pinellas County, Florida Board of Education

"Accountability" has become common to the vocabulary of both the educator and the legislator. The familiar term has shades of meaning, but has usually been used to denote the need for efficiency, productivity, or responsibility. Generally, it concerns the ability to demonstrate that resources have been used wisely in the instruction process.

Regardless of whether the educational institution will ever be totally accountable to the satisfaction of all, it is difficult today to ignore the concept of productivity when studying educational finance. Before passing judgment on present funding and expenditure arrangements, or proposing new ones, there is need for assessing results and the factors associated with results. In short, output needs to be related to input.

Some school districts have obtained larger amounts of output than others. These school districts may be described as more productive. Essential to input-output maximization, or high productivity, is knowledge of what variables have been associated with productivity. The identification of these variables in the State of Delaware was the focus of this study.

PROCEDURES

The study was designed to develop a mathematical function comprised of in-school and socioeconomic variables which predicted high and low productivity for school districts in Delaware. The procedures were as follows:

1. The relationship between current expenditure per pupil and standardized reading achievement test scores of pupils among local school districts was determined for the state of Delaware.
2. Considering this relationship, districts were classified as high productive or low productive.
3. A list of variables, postulated as having an association with productivity, was developed for testing.
4. Stepwise discriminant analysis was used to test the variables for their association with school district productivity. The association of a variable with school district productivity was measured by the relative contribution of the variable to a mathematical function which predicted accurately the classification of a school district into one of the productivity groups, high productivity or low productivity.

Relationship Between Expenditure and Achievement

The productivity of a school district was defined by the amount of student performance realized for a given level of expenditure. Student performance was measured by the median district reading achievement raw score accomplished by fifth grade pupils on the Metropolitan Achievement Test in the fall of 1970. The level of expenditure was measured by the total current expense money for the 1969-70 school year. Current expense was defined in the traditional sense of expenses for administration, instruction, plant operation, maintenance, auxiliary services and fixed charges. Excluded were debt service, capital outlay, and transportation. A per pupil current expenditure was calculated by dividing total current expense of a district by the average daily membership (ADM) for the 1969-70 school year.

Median district reading achievement raw score was related to district per pupil current expenditure by forming a regression line. The regression line represented the amount of achievement which could be expected for a given level of district expenditure. This relationship, the regression line, was defined as average productivity.

High and Low Productive Districts

High productivity was defined as those districts which achieved at a higher level than could be expected for their level of expenditure. These districts were identified, when illustrated graphically, as the districts which fell above the regression line. High productivity, then, was a group of districts with a positive deviation from the line representing average productivity.

Low productivity was defined as those districts which achieved at a lower level than could be expected for their level of expenditure. These districts were identified, when illustrated graphically, as the districts which fell below the regression line. Low productivity, then, was a group of districts with a negative deviation from the line representing average productivity.

Variables Associated with Productivity

A list of variables, postulated as having an association with school district productivity, was developed. The variables, generally, were those found to be associated with productivity in at least one of the states previously studied by the National Educational Finance Project. A review of the literature also showed them to be correlated with student performance. Other variables, requested by State Department personnel, were added to the list to be tested.

Analysis of the Variables

Stepwise discriminant analysis was used to determine the variables which were associated with productivity. Two discriminant functions, or groups of predictor variables with their relative weights for prediction, were developed. One discriminant function was a composite function which included both socioeconomic and in-school variables. The other discriminant function included only in-school variables, or those variables over which the school district has some control.

The BMD07M Stepwise Discriminant Analysis Program from the Biomedical Computer Program Package was used to develop the discriminants. Computer facilities at the University of Florida were utilized.

The percent of districts accurately classified into one of the two productivity groups (high or low productivity) was calculated. An r_{tet} test was performed to ascertain the percent of variation between the two productivity groups accounted for by each of the discriminant functions.

REVIEW OF THE LITERATURE

Measure of Educational Output

Of the past attempts to assess educational output, pupil achievement as measured by standardized tests has been most used and most often declared the best single criterion.[1]

Although achievement tests have not been developed for all areas of the school curriculum, the ability to read does affect all areas of the curriculum and tests have been available to measure reading.[2] Strang and others have claimed that reading proficiency is not only essential to success in all academic subjects, but that it is, "the entrance into almost all vocations."[3] The theory of relationship between reading and other academic subjects has been reported by Harris to have been verified by a number of studies.[4] Success in reading has been correlated with success in problem-solving ability, various forms of oral and written communication, spelling, all ninth grade subjects except mathematics, and with scholastic grade average in secondary school.[5]

As this study necessitated a single student performance measurement, reading achievement was selected. School district productivity was measured by amount of reading achievement per amount of expenditure. It was necessary to assume that high expenditure districts invested relatively more in the teaching of basic skills such as reading than low expenditure districts.

Variables Associated With Student Performance

Johns and Morphet from a review of "numerous studies," concluded, "there is a strong relationship between expenditures and the quality of education."[6] Ayer in a 1952 study and Osborn in a 1962 study found a relationship between expenditures and results in education.[7] However, Lyle, based on his review of output studies, warned that there are studies to refute the conclusion that the per pupil expenditure is the "key" determinant of pupil achievement.[8] Lyle cited a New York City school program (1964-65) where per pupil expenditure was raised by $425 for the purpose of improving reading. Reading achievement was raised, but the program staff concluded that although a large expenditure increase is associated with achievement gains, the most important factor is to discover the right mix of services which increases achievement.[9] Lyle concluded that it takes a great increase in input to gain a small amount of output and that rather than massive spending increases per se, emphasis should be placed upon input-output studies that yield information on the best combination of services.[10] Thomas found correlation between levels of resources and mean test scores, but also concluded that the manner in which the money was spent appeared to be more important than the level of expenditure.[11]

This study utilized the relationship between achievement and expenditure to define productivity. By so doing, the emphasis was placed upon finding the variables which were associated with productivity; that is, associated with obtaining higher student performance for a given level of expenditure. The remainder of the review of literature has been devoted to identifying the variables previously found to contribute the student performance. To facilitate the discussion, the variables have been classified into two groups, in-school variables and variables which describe socioeconomic and community inputs into the educational process.

In-School Variables

Kiesling identified six variables that directly related to achievement gains in two or more studies. Four of the variables were teacher quality or teacher influence related; they were as follows: years of teaching experience, male teacher starting salary, average class size, and pupil-teacher ratio. The other two variables were: number of books in school library and percentage of graduates going to college.[12]

Project talent, a massive research effort involving 400,000 high school students, seeking the correlates of a number of pupil outcomes, indicated the most important treatment factors found to date (1967) were: teacher salaries, teacher experience, number of books in the school library and per pupil expenditure.[13] These remained important even with socioeconomic factors held constant.[14]

Teacher quality was found to explain achievement changes for low income children in California. Teacher quality was defined as teachers holding certification, teaching in field, and teacher salary.[15]

Cooper and Bemis in a study designed to examine teacher personality variation in relation to pupil gains in achievement concluded that teachers who were critical, willing to accept leadership and interested in influencing and persuading others result in pupil gains.[16]

A research bulletin by the Michigan State Department of Education discussed studies that demonstrated a correlation between salaries and teacher qualification. The conclusion was that better "qualified" teachers tend to be attracted by the systems that pay the best.[17] Separate studies by Rajpal and Wilbur provided additional support for this conclusion.[18]

Class size, as an indicator of amount of teacher exposure or influence per child, was used as a variable in many of the already quoted studies. Generally, it has not been found to be significant when studied in relation to other variables. However, Woodson did find an inverse relationship between class size and achievement.[19]

Socioeconomic and Community Variables

The findings of a number of recent studies have placed the emphasis upon socioeconomic variables. In justifying culture as a variable Bernard stated that the "culturally different" youth is lacking in those experiences and skills related to high educational achievement.[20] Educational performance is related to environmental experiences, motivation and self-esteem.[21]

Probably the best known study using socioeconomic variables as inputs, and finding them contributing to more variation than school characteristics, was the Coleman Report.[22] The study collected data from some 600,000 students in 5,000 schools located throughout the country in both rural and metropolitan areas. Highly correlated with achievement was student attitude, such as his feeling of control over his own destiny, and family background influences.[23] Of the small amount of variation that was attributed to school characteristics, teacher qualities accounted for more than all others taken together.[24]

The Coleman Report has been criticized for the statistical handling of the data. Bowles and Levin contended that once amounts of variation were attributed to socioeconomic variables, the attempt to identify the school's contribution to the remaining unexplained variation was of little value. The procedure of holding background variables constant, reduced the apparent effect of school variables since school and background variables are intercorrelated.[25] George Mayeshe also criticized the data treatment of the Coleman Report because of the intercorrelated variables. Re-analyzing some of the data, he found school variables more highly correlated to achievement than did Coleman.[26]

Members of the Harvard University faculty initiated a seminar concerning the Coleman report. Seminar participants have widely published and discussed the report. Mosteller and Moynihan edited a publication which pulled together much of the seminar participants' re-analyses.[27] In general, the results of the reexaminations affirmed the overall conclusion of the Coleman Report; that is, what the child brings with him to school is most important.[28] Schools have been able to provide little influence on achievement that has been completely independent of the child's socioeconomic background.[29]

The Coleman findings were similar to those of other studies done on a more limited scale. Studies by Sexton and by Pierce and Mallory, found student achievement rises with family income.[30] Robert Parelius concluded that social class, length of residence, family background and attitude towards school have an important effect upon achievement.[31]

Others in addition to Coleman have found student motivation to influence achievement. One of Kiesling's significant correlations with achievement in two or more studies was the percentage of graduates going to college indicating motivation not only for higher education but for that which prepares for it.[32]

Burkhead employed the technique of multiple regression analysis in a study of high schools in Chicago and Atlanta. Socioeconomic variables were again most important in explaining variation, with median family income showing the highest correlation in both Chicago and Atlanta.[33] Teacher experience accounted for the most variation of the school process variables.[34]

Two 1970 studies used multivariate techniques similar to that used by Burkhead demonstrated similar results. Dunnell found socioeconomic characteristics most highly related to achievement.[35] Greene in a study of elementary children in the City of Richmond, used 36 independent variables and explained 60 percent of the variability. He concluded that socioeconomic environment would have to improve before academic achievement would improve.[36]

The research design of this study has been utilized in two recent studies, sponsored by the National Educational Finance Project, to investigate variables associated with productivity. The variables used in these productivity studies were similar to those described in the preceding sections.

DeRuzzo studied productivity in two states deriving discriminant functions of in-school and socioeconomic variables which accurately classified into high and low productivity groups 100 percent of the districts in one state and 95 percent of the districts in the second state.[37] Discriminant functions containing only in-school variables were also derived. These functions accurately classified 100 percent of the districts in one state and 69 percent of the districts in the other state.[38]

Two different states were studied by Rose. Composite discriminant functions of socioeconomic and in-school variables accurately classified into the high and low productivity groups 81 percent and 90 percent of the districts respectively.[39] The in-school variable discriminant function was unable to significantly classify districts in one state, but did classify accurately 75 percent of the districts in the other state.[40]

Eight variables were predictor variables in two or more of the four states. They were as follows: Percentage of gross incomes over $10,000, percentage of pupils eligible for ESEA Title I programs, percentage of attendance, percentage of pupils from a minority cultural background, average class size, percentage of teachers with an advanced degree or 30 hours beyond the bachelor's degree, pupil-support personnel ratio (certified personnel other than classroom teachers), and percentage of current expense devoted to instruction. Six other variables were strong predictor variables, but only in one state. They were as follows:

education level of the adult population, percentage of high school graduates entering future training, percentage of teachers with less than four years of professional preparation, fiscal effort of the school districts, average teacher salary, and the percentage of gross incomes below $3,000. One variable, education level of the adult population, was available in only one state, but in that state alone classified accurately 69 percent of the districts.[41]

The variables found to be associated with productivity in the DeRuzzo and Rose studies formed the nucleus of variables studied in Delaware.

PRESENTATION AND ANALYSIS OF THE DATA

The purpose of this study was to identify variables associated with school district productivity in the state of Delaware. This was achieved by finding a mathematical function of several measurements of socioeconomic and in-school variables which predicted high and low productivity in local school districts in Delaware. To accomplish this, (1) pupil reading achievement was related to per pupil current expense to derive a regression line which predicted the amount of reading achievement expected for a given level of expenditure; (2) considering this regression line, school districts were classified as belonging to either a high productive group or a low productive group; (3) a list of variables postulated as having an association with productivity was devised; and (4) the variables that tended to discriminate between the productivity groups of districts were identified through discriminant analysis. The results are presented in the four subsections to follow.

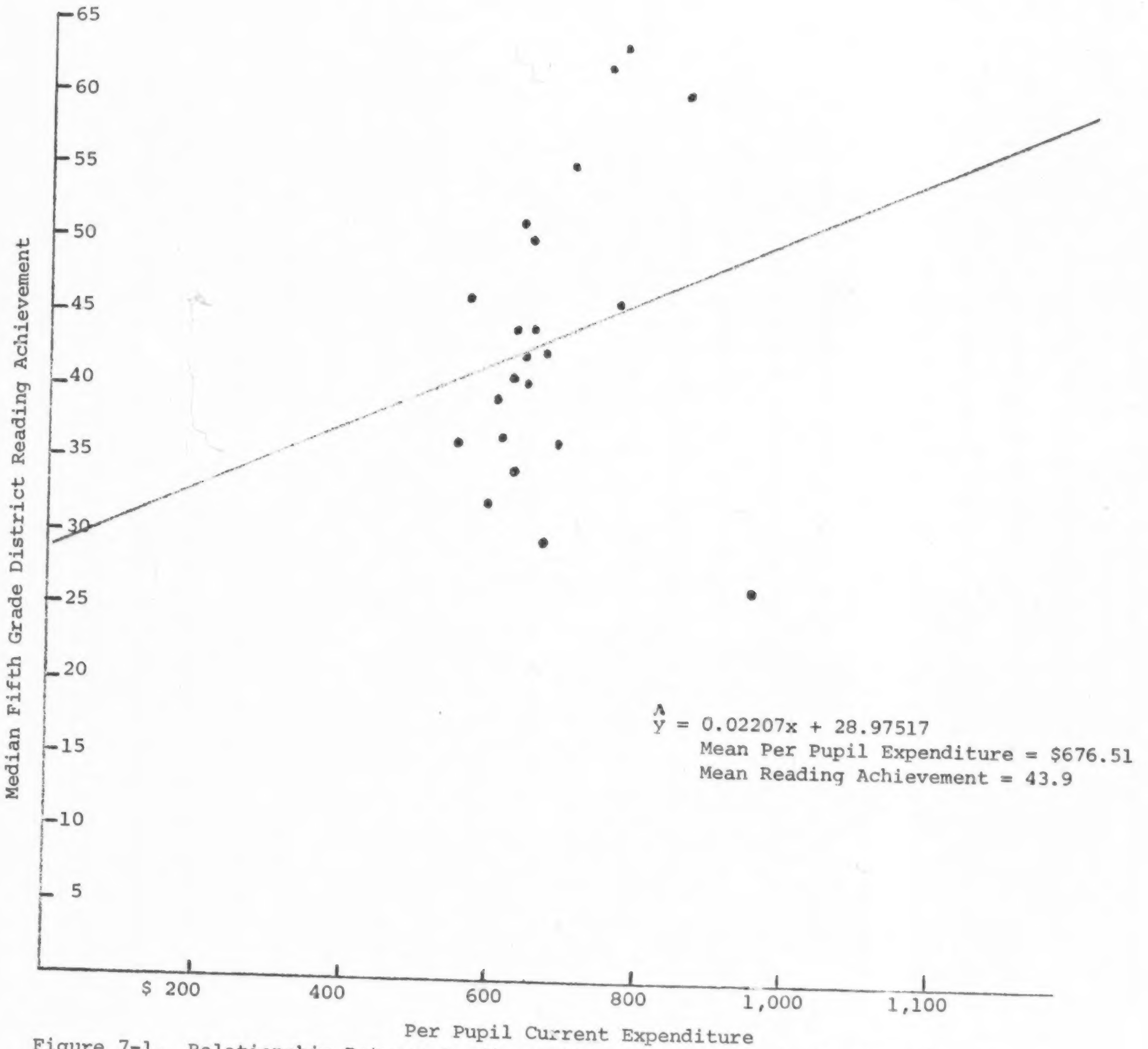
Relationship Between Reading Achievement and Per Pupil Expenditure

The relationship between reading achievement and per pupil current expense was identified by computing a regression equation. The equation took the general form of $\hat{y} = b(x) + a$, where $\hat{y}$ represented the predicted achievement score for district pupils having x dollars spent on their education.

Per pupil current expenditure served as the independent variable and was calculated by dividing current expense for each district by the number of pupils in ADM. The mean per pupil current expenditure for Delaware in the 1969-70 school year was $676.51 with a standard deviation of $94.67.

The dependent variable was district median reading raw scores achieved by fifth grade pupils on the Metropolitan Achievement Test in the fall of 1970. The statewide mean of district median scores was 43.91 with a standard deviation of 10.20.

In relating current expenditure to reading achievement, the correlation between the two was 0.21 which was not statistically significant. The regression equation was $\hat{y} = 0.02207x + 28.97517$. Graphically, this relationship was represented by a straight line illustrated by Figure 1. For the purpose of this study, the line represented average productivity; that is the amount of achievement that could be expected for a given level of expenditure. The relationship showed a gain of 2.2 points of reading raw scores for every $100.00 of additional expenditure. However, this relationship could not be relied upon for prediction purposes during the 1969-70 school year as the correlation coefficient between the two variables was



$\hat{Y} = 0.02207x + 28.97517$

Mean Per Pupil Expenditure = $676.51

Mean Reading Achievement = 43.9

Figure 7-1. Relationship Between Reading Achievement and Per Pupil Expenditure

not statistically significant. Actually, the regression line shown in Figure 1 simply divided the reading scores into scores above the average or approximately 44 and below average.

Identification of High and Low Productive Districts

High productivity was defined as those districts with a positive deviation from the line of average productivity. Graphically, they were the districts above the regression line as illustrated by Figure 1.

Low productivity was defined as those districts with a negative deviation from the line of average productivity. Graphically, they were the districts below the regression line as illustrated by Figure 1.

For the purpose of the discriminant analysis phase of the study, it would have been helpful to identify a given residual factor above and below the line as minimum limits for the definition of high and low productivity. This would have provided an area, between the two limits, of average productivity rather than a line. It might be questionable to identify districts of relative nearness to the regression line as either high or low productive. There was, however, an insufficient number of districts in Delaware to make this possible.

Ten districts of the 22 were identified as high productive and were numbered H_1 through H_{10}. Twelve districts were identified as low productive and were numbered L_{11} through L_{22}. Table 1 lists the districts with their per pupil current expenditure, median achievement score and residual or deviation from the regression line.

TABLE 7-1

DELAWARE LOCAL SCHOOL DISTRICTS

District Number	Median Achievement	Current Expenditure Per ADM	Residual*
H_1	63.9	$ 770.61	17.9
H_2	62.2	742.45	16.8
H_3	60.4	857.41	12.5
H_4	55.8	703.27	11.3
H_5	51.7	637.66	8.6
H_6	50.5	653.44	7.1
H_7	46.7	562.97	5.3
H_8	44.4	632.17	1.5
H_9	44.7	648.00	1.4
H_{10}	46.1	763.91	0.3
L_{11}	26.5	958.77	-23.6
L_{12}	29.7	668.20	-14.0
L_{13}	32.4	600.20	- 9.8
L_{14}	34.9	634.14	- 8.1
L_{15}	36.8	686.19	- 7.3
L_{16}	37.0	618.06	- 5.6
L_{17}	36.4	553.76	- 4.8
L_{18}	39.0	600.27	- 3.2
L_{19}	40.5	643.68	- 2.7
L_{20}	40.7	630.37	- 2.2
L_{21}	42.8	676.65	- 1.1
L_{22}	42.9	641.02	- 0.2

*The residual is calculated by computing the difference between the actual achievement and the predicted achievement, and represents the distance from the regression line.

Variables Postulated as Associated with Productivity

A review of the literature, which was summarized in the preceding pages, provided the nucleus of variables for the DeRuzzo and Rose studies. Variables found by them to be predictors of productivity in the states they researched formed the nucleus of variables for this study.[42] To these variables were added several that were requested by Delaware State Department of Education personnel. The variables are listed in Table 2 with a description of their computation.

The following discussion of the data compiled for the independent variables is in two subsections. The first section deals with the mean values of the two productivity groups, the interrelatedness of the variables and significant differences which existed between the productivity groups. The second subsection discusses the discriminant analysis phase of the problem, or the ability to predict productivity by the variables.

The Independent Variables

Table 3 presents the district values for the 20 variables. Table 4 shows the statewide mean values and standard deviations.

A correlation matrix, Table 5, illustrates that there were a number of interrelated variables. Of particular note, the two sets of income variables were highly correlated. Percentage of personal income under $3,000 and over $10,000 were computed from both census reports and income tax returns. The correlation coefficient was .87 between variables

TABLE 7-2

VARIABLES POSTULATED AS PREDICTORS OF LOCAL SCHOOL DISTRICT PRODUCTIVITY

Number	Variable Title	Variable Description
x_1	Teacher Salary	Mean annual teacher salary for the school district
x_2	Beginning Salary	District beginning teacher salary for teachers with at least a Bachelor Degree
x_3	Teacher Preparation	Percentage of teachers with less than 4 years of training
x_4	Advanced Preparation	Percentage of teachers with at least Master Degree level of preparation
x_5	Pupil-Support Personnel Ratio	Ratio of pupils in ADM to the number of certified non-teaching personnel of the district
x_6	Average Class Size	Ratio of pupils in ADM to the number of classroom teachers
x_7	Teacher Experience	Mean years of experience of district teachers
x_8	Local Fiscal Effort	Ratio of local revenue per pupil to adjusted gross income per pupil*
x_9	Expenses for Instruction	Percentage of total current expenditure funded for instruction
x_{10}	Adult Education Level	Median years of schooling of adult population
x_{11}	ESEA Title I Pupils	Percentage of pupils eligible for Title I instruction under ESEA
x_{12}	Minority Enrollment	Percentage of pupil enrollment that is nonwhite, Spanish-speaking, Oriental or American Indian
x_{13}	Attendance	Percent ADA to ADM
x_{14}	Dropouts	Percentage of dropouts of district pupils.
x_{15}	Median Income	Median income for families within the school district
x_{16}	Family Income Under $3,000	Percentage of family and unrelated individual income, as reported in the 1970 Federal Census, that were below $3,000

TABLE 7-2 (Continued)

Number	Variable Title	Variable Description
x_{17}	Family Income Above $10,000	Percentage of family and unrelated individual income, as reported in the 1970 Federal Census, that were above $10,000
x_{18}	Future Training	Percentage of graduates receiving post high school education or training
x_{19}	Income Under $3,000	Percentage of gross incomes less than $3,000*
x_{20}	Income Above $10,000	Percentage of gross incomes over $10,000*

*Adjusted gross income and adjusted gross income per pupil reported in Dewey H. Stollar and Gerald Boardman, Personal Income by School Districts in the United States (Gainesville, Florida: National Educational Finance Project, 1971).

4

TABLE 7-3

DISTRICT VALUES FOR TWENTY SELECTED VARIABLES

District	Variables x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
H_1	$10,787	$ 6,900	0.6%	42.3%	139.7	23.5	7.7	.093	81.8%	13.5
H_2	10,725	7,000	0.4%	40.4%	190.2	23.0	10.2	.169	80.3%	12.6
H_3	10,608	6,800	0	37.4%	114.4	21.8	7.8	.094	71.5%	12.9
H_4	10,319	7,000	0.4%	23.6%	152.4	23.4	7.3	.103	77.9%	12.4
H_5	9,752	6,850	0.8%	26.2%	162.7	23.1	9.9	.193	81.5%	12.5
H_6	9,885	6,800	1.8%	22.9%	145.2	24.0	8.2	.134	76.4%	12.3
H_7	8,685	6,700	4.4%	12.2%	180.5	23.6	6.1	.164	79.7%	12.2
H_8	10,074	6,800	0.7%	23.6%	220.3	24.4	11.4	.126	80.6%	12.0
H_9	9,217	6,800	3.0%	16.8%	164.1	24.3	11.5	.238	78.5%	11.9
H_{10}	10,431	7,000	1.0%	26.6%	174.3	23.7	8.1	.104	73.7%	12.4
L_{11}	10,689	7,400	3.7%	24.9%	96.6	20.1	11.1	.094	78.3%	10.9
L_{12}	9,493	6,650	3.6%	11.3%	168.1	22.5	8.8	.147	79.0%	10.6
L_{13}	8,884	6,700	4.3%	21.0%	174.5	23.3	9.0	.129	73.2%	10.6
L_{14}	8,535	6,000	5.1%	16.7%	169.2	24.2	10.2	.146	72.8%	11.2
L_{15}	9,144	6,600	1.3%	24.0%	137.0	23.4	6.2	.189	76.2%	12.4

TABLE 7-3 (Continued)

District	Variables x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
L_{16}	$ 8,780	$ 6,700	8.3%	11.6%	178.3	25.0	9.7	.132	75.8%	10.5
L_{17}	8,576	6,600	4.4%	14.1%	236.1	23.1	10.2	.127	78.8%	10.4
L_{18}	8,935	6,800	3.6%	17.9%	179.9	23.1	10.2	.213	80.4%	10.3
L_{19}	8,786	6,600	4.8%	18.6%	173.8	22.9	8.7	.119	75.7%	12.0
L_{20}	8,868	6,750	3.4%	9.3%	209.7	22.5	9.5	.142	75.6%	10.9
L_{21}	8,649	6,300	5.2%	12.1%	143.9	23.7	10.0	.119	73.8%	11.1
L_{22}	9.716	6,700	3.8%	24.1%	175.8	23.2	7.5	.253	79.4%	11.7

TABLE 7-3 (Continued)

District	Variables x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
H_1	0	0.5%	95.7%	3.2%	$16,916	1.4%	83.4%	84.5%	21.5%	49.4%
H_2	0	0.9%	95.0%	2.1%	13,234	3.8%	67.1%	78.1%	23.9%	34.7%
H_3	0	2.7%	95.2%	2.3%	15,185	3.0%	73.7%	71.0%	25.4%	41.4%
H_4	0.5%	0.9%	95.2%	2.2%	12,790	3.4%	67.2%	51.4%	21.6%	29.1%
H_5	4.6%	3.2%	94.2%	1.2%	11,834	3.8%	62.4%	52.8%	21.8%	28.7%
H_6	2.4%	2.1%	94.2%	3.5%	11,558	4.6%	58.6%	60.8%	20.7%	26.1%
H_7	2.2%	13.4%	94.5%	7.7%	7,818	23.0%	29.5%	57.6%	33.4%	14.2%
H_8	1.7%	2.2%	93.3%	3.5%	10,267	4.8%	50.7%	40.0%	26.0%	17.5%
H_9	7.1%	34.9%	92.5%	6.8%	6,213	26.0%	27.7%	45.9%	41.6%	11.5%
H_{10}	0.9%	4.7%	94.5%	7.5%	12,995	4.2%	67.4%	56.8%	20.5%	33.3%
L_{11}	10.3%	76.0%	89.1%	7.8%	8,276	13.6%	36.3%	34.8%	32.4%	14.9%
L_{12}	12.2%	39.4%	89.6%	12.8%	8,479	7.4%	43.4%	37.3%	26.6%	16.2%
L_{13}	28.0%	26.3%	92.3%	8.9%	7,721	9.2%	41.7%	45.5%	32.2%	15.2%
L_{14}	17.1%	29.0%	93.8%	4.7%	7,065	21.0%	29.5%	48.3%	38.4%	12.1%
L_{15}	17.1%	24.4%	93.1%	2.9%	9,161	29.7%	25.6%	50.2%	33.0%	16.0%

TABLE 7-3 (Continued)

District	Variables x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
L_{16}	3.0%	30.2%	93.2%	7.7%	$ 5,650	21.9%	27.5%	38.5%	38.3%	10.1%
L_{17}	14.6%	34.6%	94.1%	5.2%	5,752	25.0%	25.5%	43.4%	42.5%	9.0%
L_{18}	16.7%	18.2%	93.6%	7.4%	7,355	20.2%	34.1%	55.6%	33.4%	12.7%
L_{19}	11.2%	22.9%	94.1%	8.0%	7,986	18.0%	38.4%	58.4%	32.7%	21.2%
L_{20}	10.7%	23.2%	93.5%	5.3%	5,912	24.3%	26.4%	36.5%	38.0%	8.5%
L_{21}	30.8%	23.1%	93.7%	7.0%	6,154	23.2%	30.4%	36.7%	37.7%	11.7%
L_{22}	2.2%	4.8%	93.7%	7.1%	9,690	5.6%	52.4%	41.7%	24.3%	17.6%

TABLE 7-4

GROUP MEANS AND STANDARD DEVIATIONS OF INDEPENDENT VARIABLES

Variable	Variable Title	High Productive Group		Low Productive Group	
		Mean	Standard Deviation*	Mean	Standard Deviation*
x_1	Teacher Salary	$ 10,048	$ 683	$ 9,088	$ 617
x_2	Beginning Salary	$ 6,865	$ 106	$ 6,650	$ 324
x_3	Teacher Preparation	1.3%	1.4%	4.3%	1.6%
x_4	Advanced Preparation	27.2%	9.9%	17.1%	5.5%
x_5	Pupil Support Personnel Ratio	164.4	29.4	170.2	34.8
x_6	Average Class Size	23.5	0.7	23.1	1.2
x_7	Teacher Experience	8.8	1.8	9.3	1.3
x_8	Local Fiscal Effort	.142	.048	.151	.045
x_9	Expenses for Instruction	78.2%	3.4%	76.6%	2.6%
x_{10}	Adult Education Level	12.5	0.5	11.0	0.7
x_{11}	ESEA Title I Pupils	1.9%	2.3%	14.5%	8.5%
x_{12}	Minority Enrollment	6.6%	10.6%	29.3%	17.0%

TABLE 7-4 (Continued)

		High Productive Group		Low Productive Group	
Variable	Variable Title	Mean	Standard Deviation*	Mean	Standard Deviation*
x_{13}	Attendance	94.4%	1.0%	92.8%	1.7%
x_{14}	Dropouts	4.0%	2.4%	7.1%	2.5%
x_{15}	Median Income	$ 11,881	$ 3,189	$ 7,433	$ 1,361
x_{16}	Family Income Under $3,000	7.8%	8.9%	18.3%	7.7%
x_{17}	Family Income Above $10,000	58.8%	18.1%	34.3%	8.5%
x_{18}	Future Training	59.9%	14.1%	43.9%	7.8%
x_{19}	Income Under $3,000	25.6%	6.8%	34.1%	5.2%
x_{20}	Income Above $10,000	28.6%	12.0%	13.8%	3.8%

*Standard deviations demonstrate that not all of the variables were normally distributed; example, minority enrollment and ESEA Title I pupils.

x_{16} and x_{19}, and .90 between x_{17} and x_{20}. This indicated that either set of variables could be used in the analysis at the exclusion of the other.

Teacher salary (x_1), as might be expected, had high correlations with the personal income variables, beginning teacher salary and percentage of teachers with a master's degree or higher.

Teachers of advanced preparation, master's degree or higher (x_4), gravitated to districts of high socioeconomic conditions. This was demonstrated by high correlation with the income variables, particularly median family income (x_{15}) (.85).

Districts of high minority percentages (x_{12}) had poorer percentages of attendance (x_{13}) as shown by the inverse relationship -.77.

A number of variables had significant mean differences between the high and low productivity groups as is illustrated by Table 6. Significant at the .01 level were the following: teacher salary (x_1), percentage of teachers with less than 4 years of preparation (x_3), percentage of teachers with a master's degree or higher (x_4), adult education level (x_{10}), percentage of pupils eligible for ESEA Title I programs (x_{11}), percentage of enrollment from a minority group (x_{12}), percentage of dropouts (x_{14}), percentage of graduates entering post high school training (x_{18}) and all of the income variables (x_{15}, x_{16}, x_{17}, x_{19}, x_{20}). Significant at the .05 level was percentage of attendance (x_{13}).

Association with Productivity

The variables were exposed to the analysis in two groups, a composite group and an in-school group. The composite group consisted of all

TABLE 7-5

WITHIN GROUPS CORRELATION MATRIX*

Variable	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
x_1	1.00	0.67	-0.58	0.75	-0.47	-0.64	0.01	-0.30	0.11	0.30
x_2		1.00	-0.26	0.31	-0.25	-0.64	0.10	-0.13	0.33	-0.11
x_3			1.00	-0.59	0.19	0.49	0.16	0.03	-0.07	-0.44
x_4				1.00	-0.39	-0.41	-0.11	-0.15	0.03	0.60
x_5					1.00	0.47	0.24	0.22	0.28	-0.42
x_6						1.00	0.01	0.26	-0.06	-0.14
x_7							1.00	0.04	0.17	-0.56
x_8								1.00	0.42	-0.05
x_9									1.00	-0.10
x_{10}										1.00

*These intercorrelations are not exactly the same as Pearson Product Moment Correlations although they are similar. The computer program used to compute these correlations determines the within high and low group correlations and strikes a type of average between the within group correlations. The correlations in this table are slightly lower in most cases than the regular Pearson Product Moment Correlations.

TABLE 7-5 (Continued)

Variable	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}	x_{16}	x_{17}	x_{18}	x_{19}	x_{20}
x_1	-0.38	0.13	-0.29	- 0.11	0.75	-0.69	0.73	0.20	-0.66	0.66
x_2	-0.37	0.41	-0.46	0.14	0.23	-0.31	0.25	-0.07	-0.31	0.18
x_3	-0.05	0.21	0.01	0.44	-0.64	0.39	-0.51	-0.24	0.52	-0.49
x_4	-0.16	-0.18	0.17	- 0.41	0.85	-0.54	0.75	0.67	-0.52	0.83
x_5	-0.09	-0.33	0.28	0.04	-0.43	0.17	-0.30	-0.18	0.27	-0.43
x_6	0.13	-0.41	0.37	0.01	-0.40	0.32	-0.34	-0.13	0.29	-0.37
x_7	0.17	0.42	-0.35	0.00	-0.40	0.06	-0.24	-0.35	0.39	-0.35
x_8	-0.06	-0.17	-0.02	0.01	-0.32	0.26	-0.32	-0.10	0.13	-0.39
x_9	-0.28	0.06	-0.19	0.02	-0.04	-0.05	-0.03	-0.02	-0.11	-0.11
x_{10}	-0.15	-0.34	0.37	- 0.42	0.64	-0.13	0.42	0.55	-0.38	0.64
x_{11}	1.00	0.06	-0.02	0.01	-0.24	0.25	-0.24	-0.07	0.29	-0.19
x_{12}		1.00	-0.77	0.34	-0.36	0.28	-0.41	-0.36	0.42	-0.32
x_{13}			1.00	-0.52	0.21	0.11	0.19	0.53	0.02	0.30
x_{14}				1.00	-0.29	-0.05	-0.15	-0.25	0.03	-0.23
x_{15}					1.00	-0.72	0.92	0.62	-0.79	0.95
x_{16}						1.00	-0.89	-0.17	0.87	-0.64
x_{17}							1.00	0.48	-0.84	0.90
x_{18}								1.00	-0.25	0.73
x_{19}									1.00	-0.66
x_{20}										1.00

TABLE 7-6

F STATISTIC FOR VARIABLES

Variable	Variable Title	F Statistic
x_1	Teacher Salary	11.9980 **
x_2	Beginning Salary	4.0173
x_3	Teacher Preparation	20.9209 **
x_4	Advanced Preparation	9.0641 **
x_5	Pupil-Support Personnel Ratio	0.1775
x_6	Average Class Size	0.8526
x_7	Teacher Experience	0.4217
x_8	Local Fiscal Effort	0.2044
x_9	Expenses for Instruction	1.5906
x_{10}	Adult Education Level	32.2020 **
x_{11}	ESEA Title I	20.3009 **
x_{12}	Minority Enrollment	13.4789 **
x_{13}	Attendance	7.1346 *
x_{14}	Dropouts	8.5334 **
x_{15}	Median Income	19.2878 **
x_{16}	Family Income Under $3,000	8.8148 **
x_{17}	Family Income Above $10,000	17.5559 **
x_{18}	Future Training	11.2992 **
x_{19}	Income Under $3,000	11.0199 **
x_{20}	Income Above $10,000	16.6283 **

Degrees of freedom: 1 and 20

** $<$ .01 Probability of occurring by chance
* $<$ .05 Probability of occurring by chance

variables, socioeconomic and in-school. The in-school group were those more easily controlled by the school district and were generally descriptive of personnel, class size, etc.

Composite function. Table 7 relates the order in which all twenty variables were entered into the function.

In order to restrict the number of variables in the final prediction function, and at the same time allow for optimum accurate assignment of districts, the following maximum classification criteria were used: (1) the number of variables to be included would be terminated at the point beyond which no single variable's F-to-enter value had an associated probability greater than or equal to a .10 level of significance, and (2) no additional significant variable's F-to-enter would improve the percent of accurate classification.[43]

Six of the variables met the maximum classification criteria and were present in the prediction function. The six variables were median education level of the adult population (x_{10}), percentage of enrollment eligible for ESEA Title I programs (x_{11}), mean years of experience of district's teachers (x_7), percentage of enrollment from a minority group (x_{12}), beginning teacher salary of the district (x_2), and percentage of teachers with master's level of preparation or higher (x_4). The prediction equations for the high and low group respectively were as follows:

$$H = 0.33205x_2 - 1006.16431x_4 + 35.97629x_7 + 170.66499x_{10}$$
$$+ 406.33740x_{11} - 274.76855x_{12} - 2220.62500$$

$$L = 0.32006x_2 - 964.45264x_4 + 33.70200x_7 + 161.13026x_{10}$$
$$+ 420.59106x_{11} - 254.33173x_{12} - 2021.00781$$

TABLE 7-7

ORDER OF VARIABLE ENTRY INTO PREDICTION EQUATION

Step	Variable	Variable Title	F-To-Enter Value	Probability of Occurring by Chance	Percent Classified Accurately
1	x_{10}	Adult Education Level	32.2020	$<.01$	91
2	x_{11}	ESEA Title I Pupils	4.9643	$<.05$	86
3	x_7	Teacher Experience	3.2806	$<.10$	95
4	x_{12}	Minority Enrollment	1.9195	NS	95
5	x_2	Beginning Salary	1.1741	NS	91
6	x_4	Advanced Preparation	3.5081	$<.10$	100
7	x_{18}	Future Training	1.3466	NS*	
8	x_{15}	Median Income	1.5551	NS	
9	x_{20}	Income Over $10,000	1.6644	NS	
10	x_6	Average Class Size	1.3713	NS	
11	x_9	Expenses for Instruction	1.1920	NS	
12	x_{17}	Family Income Above $10,000	0.7787	NS	
13	x_{19}	Income Under $3,000	3.5392	$<.10$	
14	x_{16}	Family Income Under $3,000	1.1788	NS	
15	x_8	Local Fiscal Effort	1.0457	NS	
16	x_{13}	Attendance	0.5196	NS	
17	x_1	Teacher Salary	10.0683	$<.05$	
18	x_3	Teacher Preparation	1.3992	NS	
19	x_5	Pupil-Support Personnel Ratio	1.3043	NS	
20	x_{14}	Dropouts	0.0245	NS	

*NS designates a probability $>$ .10 of occurring by chance. Dotted line represents the last significant F-to-enter. All variables above the line are contained in the equation.

To predict the group membership of the district, high or low productivity, the value for the appropriate variable is substituted for x in each function. Computation produces two values, one for the high group (H) and one for the low group (L). The numerically lower value of the two designates the appropriate group membership.

The six variables taken together classified accurately all (100 percent) of the districts into their predetermined productivity groups. Table 8 is the classification matrix at the end of the sixth step.

TABLE 7-8

CLASSIFICATION MATRIX FOR COMPOSITE FUNCTION

	High Group	Low Group
High Group	10*	0
Low Group	0	12*

* Designates accurate classification.

Considering all of the variables, the median adult education level of the district's population (x_{10}) had initially the highest F-to-enter value, 32.2020 (Table 7). This variable alone classified 91 percent of the districts accurately into their previously identified productivity groups.

Efficiency of classification or the amount of variance between the two groups accounted for was determined by computing a tetrachoric correlation coefficient (r_{tet}). When the coefficient was squared, the efficiency of the discriminant function was expressed as a percentage of variance accounted for by the variables included in the function. Adult education level (x_{10}) had an r_{tet} coefficient of .92, or alone accounted for 85 percent of the variation between the two productivity groups. In short, the education level of the adult population of the school district was the most potent predictor of productivity. In Delaware, as well as in one of the states previously studied by Rose, the productivity level of a school district might well be identified by knowing only the median level of educational attainment by the adult population of the school district.[44] High productive districts had a mean level of educational attainment of better than a high school education.

The analysis was concluded after the sixth step. The variables at steps 4 and 5 did not have a significant F-to-enter value, but were followed by a significant variable at step 6.[45] Considering all six variables, all districts were accurately classified. The r_{tet} coefficient was 1.0 and 100 percent of the variance was accounted for by the six variables.[46]

To ascertain what predicatbility the variables would have as a composite function without the influence of adult education level (x_{10}), the variable was eliminated and the data re-run. Without the influence of x_{10}, two variables accurately classified 91 percent of the districts and accounted for 92 percent of the variation between the producitivty groups. The two variables were percentage of teachers with less than four years of professional preparation (x_3), and percentage of enrollment eligible for ESEA Title I programs (x_{11}). Knowing these two variables, for which data are more easily obtainable, productivity may be predicted almost as well as by knowing the adult education level.

In-School Function. Table 9 relates the order in which the in-school variables were entered into the equation.

Three of the variables met the maximum classification criteria and were present in the prediction equation.[47] The three variables were percentage of district teachers with less than four years of professional preparation (x_3), average class size (x_6), and the beginning salary of district teachers (x_2). The prediction equations for the high and low group respectively were as follows:

$$H = 0.29458x_2 - 1244.78198x_3 + 79.81584x_6 - 1940.01709$$

$$L = 0.28600x_2 - 1049.02319x_3 + 76.58824x_6 - 1812.38794$$

The three variables taken together classified accurately 91 percent of the districts into their previously identified productivity groups. Table 10 is the classification matrix at the end of the third step.

Considering all in-school variables, the percentage of district teachers with less than four years of professional training (x_3) had initially the highest F-to-enter value, 20.9208 (Table 9). This variable alone classified 86 percent of the districts accurately into their predetermined productivity groups. The variable (x_3) had an r_{tet} coefficient of .92 which indicated that 85 percent of the variation was accounted for between productivity groups. In Delaware, the productivity level of a school district might well be identified, also, by knowing only the percentage of teachers with less than four years of professional preparation. Low productive districts had a mean of 4 percent of teachers with less than Bachelor Degree training, while the high productive districts' mean was 1 percent.

TABLE 7-9

ORDER OF IN-SCHOOL VARIABLE ENTRY INTO PREDICTION EQUATION

Step	Variable	Variable Title	F-To-Enter Value	Probability of Occurring by Chance	Percent Classified Accurately
1	x_3	Teacher Preparation	20.9208	$<.01$	86
2	x_6	Average Class Size	6.1448	$<.05$	91
3	x_2	Beginning Salary	4.8944	$<.05$	91
4	x_5	Pupil-Support Personnel Ratio	0.6131	NS*	
5	x_1	Teacher Salary	0.1580	NS	
6	x_4	Advanced Preparation	0.0619	NS	
7	x_9	Expenses for Instruction	0.0056	NS	
8	x_7	Future Training	0.0022	NS	

*NS designates a probability $>.10$ of occurring by chance. Dotted line represents the last significant F-to-enter. All variables above the line are contained in the equation.

TABLE 7-10

CLASSIFICATION MATRIX FOR IN-SCHOOL FUNCTION

	High Group	Low Group
High Group	9*	1
Low Group	1	11*

*Designates accurate classification.

The analysis was concluded after the third step. The three predictor variables, taken together, classified accurately 91 percent of the districts. The r_{tet} coefficient was .96 which indicated that 95 percent of the variation between productivity groups was accounted for by the three variables.

The analysis could have been concluded one step earlier as the third variable, beginning salary (x_2), did not increase the percentage of accurate classification. The three variables were included as average class size (x_6), which entered on the second step, may have been misleading. The variable had an inverse relationship; that is, the high productive group had a mean value of 23.48, while the low productive group had a mean value of 23.08. This was not a statistically significant difference between the two groups. However, the slight difference between the two groups was sufficient to improve the classification when 86 percent of the districts were already accurately classified by variable x_3. The variable of the third step, beginning teacher salary (x_2) had a difference of about $200 between the high group mean and the low group mean.

SOCIOECONOMIC VARIABLES VERSUS IN-SCHOOL VARIABLES

Another method of analyzing the relative contribution of socioeconomic variables and in-school variables is to use Pearson Product Moment multiple correlation and multiple regression equation. The methods were applied to the data presented in the previous sections of this report. Following is a summary of the findings:

Socioeconomic Variables

The multiple correslation (R) between average reading score and the three socioeconomic variables x_{10}, adult reading level; x_{15}, median income and x_{12}, percent minority enrollment was .9025. This is a very high correlation. The square of .9025 is .8145 which means a little over 81 percent of the variation in reading scores is associated with these three socioeconomic variables. The multiple regression equation was:

$$\text{Reading score} = 4.09521x_{10} + .00065x_{15} - 23.95947x_{12} - 5.58051$$

In-School Variables

The multiple correlation (R) between average reading score and the four in-school variables x_4, advanced preparation; x_6, average class size; x_3, teacher preparation; and x_7, teacher experience was .81913. The square of .81913 is .67098 which means that approximately 67 percent of the variation in reading scores is associated with these four in-school variables. It appears therefore that socioeconomic variables have a somewhat higher association with reading scores than in-school variables. However, both socioeconomic variables and in-school variables have a relatively high correlation with reading scores. Therefore, in evaluating the relative productivity of school systems as measured by reading scores it is evident that both socioeconomic variables and in-school variables should be considered.

The regression equation for predicting reading scores from in-school variables is as follows:

$$\text{Average reading score} = 57.77915x_4 + 3.38794x_6 - 155.40490x_3 - .78246x_7 - 35.79841$$

Productivity Above or Below Expectations

Table 11 shows the actual average reading scores of Delaware school districts and the scores predicted from socioeconomic variables in accordance with the regression equation based on socioeconomic variables and the deviation of actual reading scores above or below the predicted score. The district with a deviation above its predicted reading score can be considered as above average in productivity and a district with a deviation below its predicted score can be considered as below average in productivity. Under this method a district with unfavorable socioeconomic characteristics can be considered as productive as a district with favorable socioeconomic characteristics if it exceeds its predicted score.

The deviation of actual scores from predicted scores shown in Table 11 can be considered as variations in reading scores not explained by socioeconomic variables. The attempt was made to find in-school variables associated with the most productive school systems as determined by favorable and unfavorable deviations shown in Table 11. Only one in-school variable, x_7, teacher experience, was found to be significantly correlated with productivity or measured in Table 11. The rank order correlation of teacher experience, x_7 with favorable deviation of actual reading scores from predicted scores was .3890. This correlation was significant at the .037 level or 3.7 percent level. This would indicate

TABLE 7-11

READING SCORE PREDICTED FROM SOCIOECONOMIC VARIABLES AND ACTUAL READING SCORE

District*	Reading Score Predicted from Socioeconomic Variables	Actual Reading Score	Difference	Percent Difference	District**
H_1	61.3	63.9	2.6	.041	H_8
H_2	56.9	62.2	5.3	.086	H_6
H_3	53.6	60.4	6.8	.113	H_4
H_{10}	51.9	46.1	- 5.9	-.127	L_{16}
H_4	50.8	55.8	5.0	.090	H_5
H_8	50.5	44.4	- 6.1	-.137	L_{17}
L_{15}	50.5	36.8	-13.7	-.372	L_{22}
H_6	49.5	50.5	1.0	.019	H_{12}
H_5	48.6	51.7	3.1	.060	H_7
L_{22}	44.9	42.9	- 2.1	-.050	L_2
H_9	42.6	44.7	2.1	.050	H_{11}
L_{13}	41.5	32.4	- 9.1	-.282	L_{21}
L_{14}	39.9	34.9	- 5.0	-.144	L_{18}
H_7	39.6	46.7	7.1	.152	H_3
L_{18}	39.2	39.0	- .2	-.006	L_1
L_{19}	38.3	40.5	2.3	.055	H_9
L_{17}	35.8	36.4	.6	.017	H_{13}

TABLE 7-11 (Continued)

District*	Reading Score Predicted from Socioeconomic Variables	Actual Reading Score	Difference	Percent Difference	District**
L_{21}	35.6	42.8	7.2	.169	H_2
L_{16}	35.1	37.0	1.9	.051	H_{10}
L_{12}	34.5	29.7	- 4.8	-.161	L_{19}
L_{20}	33.1	40.7	7.6	.187	H_1
L_{11}	32.3	26.5	- 5.8	-.217	L_{20}

*Districts labelled high and low productive according to whether the reading score was above or below the state average.

**Districts labelled high or low productive according to whether the reading score was above or below the score to expect due to the socioeconomic conditions in the district.

that experienced teachers are more likely to attain superior reading achievement than inexperienced teachers after due consideration is given to the effect of socioeconomic factors on reading achievement.

As pointed out previously in this study, in-school variables are intercorrelated with socioeconomic variables and this tends to conceal the actual effect of in-school factors on school achievement. Therefore, it is quite possible that some in-school factors other than teacher experience contribute to a district attaining a reading level above the level it would normally expect from its socioeconomic characteristics.

CONCLUSIONS AND RECOMMENDATIONS

Prior to presenting any conclusions or developing any recommendations, two general considerations need to be mentioned; one concerns the designation of productivity and the other concerns the limitation on conclusions which is inherent in this type of study.

The grouping of districts into high productive and low productive categories is convenient for the study. There is a danger of extending this classification to labels of "productive" and "unproductive." Such a designation would be a misconception of the structure of this study. The districts' relation to one another on the productivity continuum is relative. The correlation between reading achievement and expenditure was statistically insignificant and average productivity could be defined at the state mean or median achievement level. All districts in Delaware may be more productive or less productive than the average district of another state.

The nature of this investigation limits conclusions to that of association. Causality cannot be determined without a study design that permits control or manipulation of the variables, an impossible task for a short term study. An exploratory field study of the type presented in this report can identify variables that are associated with the differences between groups. Recommendations, then, are mostly educated conjectures based upon the evidence of the variables associated with the groups. In this study, the recommendations are derived from the variables' identified association with the districts comprising high and low productivity.

Socioeconomic Variables

Generally, past research efforts using multivariate techniques to analyze variation in achievement indicate that socioeconomic variables account for a larger percentage of variation in reading scores than in-school variables. The study in Delaware had similar findings.

All socioeconomic variables demonstrated significantly different mean values between the high productive group and the low productive group. All significant in-school variables had high correlations with at least some of the socioeconomic variables. A network of intercorrelations existed between the socioeconomic variables. The multiple correlation between reading achievement and adult educational level, median income and percent minority enrollment was .9025 which means that these three socioeconoimc variables were associated with 81 percent of the variations in reading scores.

Median adult education level (x_{10}) was the best single predictor of productivity. It alone classified accurately 91 percent of the districts. However, this variable had high correlations with income variables, median income (x_{15}) (.64) and income above $10,000 ($x_{20}$) (.64). The relationship between higher educational attainment and better personal income reflected community attitudes concerning schools. These districts tended to pay their teachers better than the average, had a higher percentage of master's level teachers and a lower percentage of teachers with less than four years of preparation. They also had higher achievement, higher percentage of post high school education, lower dropout rate and better attendance.

A quantity of recent literature is addressed to this situation. Better education leads to better income, a higher standard of living and higher aspirations for educational attainment among children. Motivational level is difficult to measure, but has great influence on educational achievement.

To translate this into funding, a state responsibility is equal educational opportunity. If motivational level affects educational attainment, then consideration of programs designed to raise motivational level is in order. Program possibilities would be better counseling (parents as well as children), community school concept, compensatory education and programs designed to enhance a child's self concept and school identity. If a child can identify with a school, the school becomes the place to be and motivational level climbs.

In-School Variables

In-school variables were interrelated with socioeconomic variables and it is difficult to credit a given amount of variation to any single variable. However, in-school variables were successful in predicting productivity.

Mean teacher salary (x_1), percentage of teachers with less than four years of training (x_3) and percentage of teachers with a Master Degree or higher (x_4) had a significant difference between the mean values of the high productive and low productive districts. Funding which would attract more skilled teachers to the lower achievement areas is worthy of consideration.

The multiple correlation between reading score and the four in-school variables; advanced preparation, average class size, teacher preparation and teacher experience was .81913. This means that 67 percent of the variation in reading scores was associated with these in-school factors.

Teacher experience was found to have a significant correlation with favorable deviations of reading scores from the reading score expected from the socioeconomic characteristics of a district.

Although attendance was not a predictor variable, mostly due to its interrelatedness with other variables, a statistically significant difference did exist between the high and low groups. Again, motivational level may well be the answer to higher achievement. The funding of programs which would encourage attendance would be worthy of consideration. If such programs are to better attendance through higher aspiration levels, the programs need to be of positive nature. Encouragement, or offering that which will attract the child to school, rather than causing the child to come to school through punitive action is desired.

FOOTNOTES

1. Michigan Department of Education, Research Into the Correlates of School Performance, A Review and Summary of Literature, Assessment Report No. 3, 1970, pp. 1-3.

2. Ruth Strang, Constance M. McCullough and Arthur E. Traxler, The Improvement of Reading, Fourth Edition (New York: McGraw-Hill Book Co., 1967), pp. 297-382.

3. Ibid., p. 4.

4. Albert J. Harris, How to Increase Reading Ability, Fourth Edition (New York: David McKay Co., Inc., 1962), pp. 4-7.

5. Ibid.

6. Roe L. Johns and Edgar L. Morphet, The Economics and Financing of Education, A Systems Approach, Second Edition (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969), p. 198.

7. Frederic L. Ayer, "An Analysis of Certain Characteristics Related to the Quality of Education" (Ph.D. Dissertation, Columbia University, 1952), pp. 14-15; Morris Osborn "The Effect of Expenditure Per Pupil and Size of School on the Quality of Education in the Secondary Schools of Mississippi" (Ed.D. Dissertation, University of Southern Mississippi, 1962).

8. Jerolyn R. Lyle, Research on Achievement Determinant in Educational Systems: A Survey (National Center for Educational Statistics, Division of Operations Analysis, Office of Education), pp. 1-2.

9. Ibid., pp. 17-18.

10. Ibid., p. 12.

11. James A. Thomas, "Efficiency in Education: A Study of the Relationship Between Selected Inputs and Mean Test Scores in a Sample of Senior High Schools" (Ph.D. Dissertation, Stanford University, 1962).

12. Herbert J. Kiesling, "Measuring a Local Government Service: A Study of School Districts in New York State," Review of Economics and Statistics, Vol. 49: No. 3, August, 1967, pp. 356-67.

13. John C. Flanagan and others, A Survey and Follow-up Study of Educational Plans and Decisions in Relation to Aptitude Patterns: Studies of the American High School (Pittsburg: University of Pittsburg, 1962), pp. 1-8.

14. Ibid., pp. 10-11

15. Charles S. Benson and others, Report of the Senate Fact Finding Committee on Revenue and Taxation, State and Local Fiscal Relationships in Public Education in California (Sacramento, California: Senate of the State of California, 1965).

16. James G. Cooper and Katherine Bemis, Teacher Personality, Teacher Behavior and Their Effects Upon Pupil Achievement, Final Report (Albuquerque, New Mexico: New Mexico University, 1967).

17. Michigan Department of Education, p. 17.

18. P. L. Rajpal, "Relationship Between Expenditure and Quality Characteristics of Education in Public Schools," Journal of Educational Research, Vol. 63, October, 1969, pp. 57-59; Thomas P. Wilbur, "Relationship Between Certain Staff Characteristics and Measures of Holding Power and Expenditure," LAR Research Bulletin, Vol. 8, February, 1969, pp. 7-11. This study involved sixty-eight school systems.

19. Marshall S. Woodson, Effect of Class Size as Measured by an Achievement Test Criterion (Columbia University: Institute of Administrative Research, February, 1968).

20. Harold Bernard, Psychology of Learning and Teaching (New York: McGraw-Hill Book Co., 1965), p. 228.

21. Ibid.

22. James S. Coleman and others, Equality of Educational Opportunity (Washington, D.C.: U.S. Department of Health, Education and Welfare, Office of Education, 1966).

23. Ibid.

24. Ibid.

25. Samuel S. Bowles and Henry M. Levin, "The Determinants of Scholastic Achievement, An Appraisal of Some Recent Evidence," The Journal of Human Resources, Vol. 3: No. 1, Winter, 1966, pp. 3-24. They reported a contrasting finding with teacher quality as indicated by salaries and verbal scores relating to student achievement.

26. George W. Mayeske and others, Correlational and Regression Analysis of Differences Between the Achievement Levels of Ninth Grade Schools from the Educational Opportunities Survey (National Center of Educational Statistics, Washington, D.C., 1968), pp. 54-55 (Mimeographed).

27. Frederick Mosteller and Daniel P. Moynihan, editors, On Equality of Educational Opportunity (New York: Vintage Books, 1972.

28. Marshall S. Smith, "Equality of Educational Opportunity: The Basic Findings Reconsidered," On Equality of Educational Opportunity (New York: Vintage Books, 1972), pp. 230-342.

29. Ibid., p. 311.

30. Patricia C. Sexton, Education and Income (New York: The Viking Press, 1961), p. 25; Louise Pierce and Richard Mallory, Analysis of Achievement Project Design, Interagency Planning for Urban Educational Needs, Number 5, Fresno City Unified School District, California (Washington, D.C.: U.S. Department of Health, Education, and Welfare, Bureau of Elementary and Secondary Education, Office of Education, October, 1968), p. 2.

31. Robert James Pareluis, Sociological Influences on the Achievement of Lower Class Negro Children (Washington, D.C.: U.S. Department of Health, Education and Welfare, Office of Education, November, 1967).

32. Kiesling, pp. 356-67.

33. Jesse Burkhead, Thomas G. Fox and John W. Holland, Input and Output in Large-City High Schools (Syracuse, New York: University Press, 1967), pp. 39-101.

34. Ibid., pp. 39-59.

35. John Peter Dunnell, "Input and Output Analysis of Suburban Elementary School Districts" (Ed.D. Dissertation, Illinois State University, 1970).

36. Robert Taylor Greene, "An Analysis of the Relationships of Selected Factors to Academic Achievement of Pupils" (Ed.D. Dissertation, University of Virginia, 1970).

37. David DeRuzzo, "Identification of Variables to Predict Local School District Productivity" (Ed.D. Dissertation, University of Florida, 1972), pp. 59-60.

38. Ibid., pp. 62-68.

39. Scott N. Rose, "A Study to Identify Variables to Predict Local School District Productivity in Two States" (Ed.D. Dissertation, University of Florida, 1972), pp. 91-101.

40. Ibid., pp. 98-109.

41. Ibid., p. 93.

42. See pages 10 - 12 of this study.

43. Fred E. Schultz and James F. Goggans, A Systematic Procedure for Determining Potent Independent Variables in Multiple Regression and Discriminant Analysis (Auburn, Alabama: Agricultural Experiment Station, Auburn University, Bulletin 336, November, 1961), pp. 25-26. The authors caution against setting too stringent a significance level when deciding the question of when to stop the discriminant analysis. The authors suggest the .10 level.

44. Rose, pp. 126-127.

45. In utilizing an F statistic, the smaller the sample, the greater the probability that an event has occurred by chance. As variables were entered and the degrees of freedom decreased, the greater was the probability that a variable had entered by chance; therefore, the larger the F statistic at the .10 level of significance necessary to have entered the variable. However, variables at subsequent steps occasionally increase the probability that the next entered variable will improve the ability of the function to classify in conjunction with variables already entered. This ability raises the F-to-enter value at that setp to the acceptable probability range. This is what occurred between steps 5 and 6. It also occurred between steps 12 and 13, and setps 16 and 17; however, as 100 percent classification was already realized, it was not necessary to continue the analysis to that point.

46. See Table 7.

47. Maximum classification criteria is explained on page 33 of this chapter.

BIBLIOGRAPHY

Ayer, Frederic L. "An Analysis of Certain Characteristics Related to the Quality of Education." Ph.D. Dissertation, Columbia University, 1952. Cited in Dissertation Abstracts, 13:188-89.

Benson, Charles S. and others. Report of the Senate Fact Finding Committee on Revenue and Taxation, State and Local Fiscal Relationships in Public Education in California. Sacramento, California: Senate of the State of California, 1965.

Bernard, Harold W. Psychology of Learning and Teaching. New York: McGraw-Hill Book Co., 1965.

Bowles, Samuel S. and Levin, Harry M. "The Determinants of Scholastic Achievement, An Appraisal of Some Recent Evidence," The Journal of Human Resources. Vol. 3: No. 1, pp. 3-24 (Winter, 1968).

Burkhead, Jesse; Fox, Thomas G. and Holland, John W. Input and Output in Large-City High Schools. Syracuse, New York: University Press, 1967.

Coleman, James S. and others. Equality of Educational Opportunity. Washington, D.C.: U.S. Department of Health, Education and Welfare, Office of Education, 1966.

Cooper, James G. and Bemis, Katherine. Teacher Personality, Teacher Behavior and Their Effects Upon Pupil Achievement, Final Report. Albuquerque, New Mexico: New Mexico University, 1967. Cited in Education Research Information Center, microfilm number ED 012707.

DeRuzzo, David. "Identification of Variables to Predict Local School District Productivity." Ed.D. Dissertation, University of Florida, 1972.

Dunnell, John Peter. "Input and Output Analysis of Suburban Elementary School Districts." Ed.D. Dissertation, Illinois State University, 1970. Cited in Dissertation Abstracts International, 31:1532A.

Flanagan, John C. and others. A Survey and Follow-up Study of Educational Plans and Decisions in Relation to Aptitude Patterns: Studies in Relation to Aptitude Patterns: Studies of the American High School. Pittsburg: University of Pittsburg, 1962.

Greene, Robert Taylor. "An Analysis of the Relationships of Selected Factors to Academic Achievement of Pupils." Ed.D. Dissertation, University of Virginia, 1970. Cited in Dissertation Abstracts International, 31:4416A-4417A.

Harris, Albert J. How to Increase Reading Ability, Fourth Edition, New York: David McKay Co., Inc., 1962.

Johns, Roe L. and Morphet, Edgar L. The Economics and Financing of Education, A Systems Approach, Second Edition, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969.

Kiesling, Herbert J. "Measuring a Local Government Service: A Study of School Districts in New York State," Review of Economics and Statistics, Vol. 49: No. 3, pp. 356-67 (August, 1967).

Lyle, Jerolyn R. Research on Achievement Determinants in Educational Systems: A Survey. National Center for Educational Statistics, Division of Operations Analysis. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education. Cited in Education Research Information Center, microfilm number ED 018858.

Mayeske, George W. and others. Correlational and Regression Analysis of Differences Between the Achievement Levels of Ninth Grade Schools from the Educational Opportunities Survey. Washington, D.C.: National Center for Educational Statistics, 1968 (mimeographed). Cited in Education Research Information Center, microfilm number ED 037398.

Michigan Department of Education. Research Into the Correlates of School Performance, A Review and Summary of Literature, Assessment Report No. 3, 1970.

Mosteller, Frederick and Moynihan, Daniel P., editors. On Equality of Educational Opportunity. New York: Vintage Books, 1972.

Parelius, Robert James. Sociological Influences on the Achievement of Lower Class Negro Children. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, November, 1967. Cited in Education Research Information Center, microfilm number ED 016730.

Pierce, Louise and Mallory, Richard. Analysis of Achievement Project Design, Interagency Planning for Urban Educational Needs, Number 5, Fresno City Unified School District, California. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Bureau of Elementary and Secondary Education, Office of Education, October, 1968. Cited in Education Research Information Center, microfilm number ED 038747.

Rajpal, P. L. "Relationship Between Expenditure and Quality Characteristics of Education in Public Schools," Journal of Educational Research. Vol. 63: pp. 57-59 (October, 1969).

Rose, Scott N. "A Study to Identify Variables to Predict Local School District Productivity in Two States." Ed.D. Dissertation, University of Florida, 1972.

Schultz, Fred E. and Coggans, James F. A Systematic Procedure for Determining Potent Independent Variables in Multiple Regression and Discriminant Analysis. Auburn, Alabama: Agricultural Experiment Station, Auburn University, Bulletin 336, November, 1961.

Strang, Ruth; McCullough, Constance M. and Traxler, Arthur E. The Improvement of Reading, Fourth Edition. New York: McGraw-Hill Book Co., 1967.

Thomas, James A. "Efficiency in Education: A Study of the Relationship Between Selected Inputs and Mean Test Scores in a Sample of Senior High Schools." Ph.D. Dissertation, Stanford University, 1962. Cited in Dissertation Abstracts, 13:4203.

Wilbur, Thomas P. "Relationship Between Certain Staff Characteristics and Measures of Holding Power and Expenditure," LAR Research Bulletin. Vol. 8: pp. 7-11. (February, 1969).

Woodson, Marshall S. Effect of Class Size as Measured by an Achievement Test Criterion. New York: Columbia University, Institute of Administrative Research, February, 1968. Cited in Educational Research Information Center, microfilm number ED 021320.